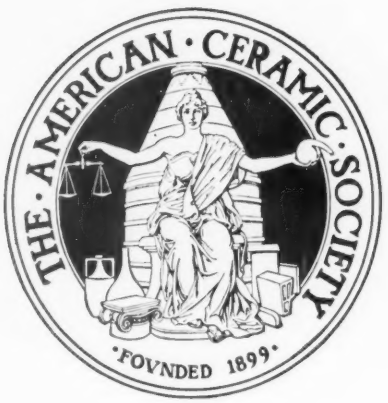
CERAMIC ABSTRACTS and THE BULLETIN

AMERICAN CERAMIC SOCIETY



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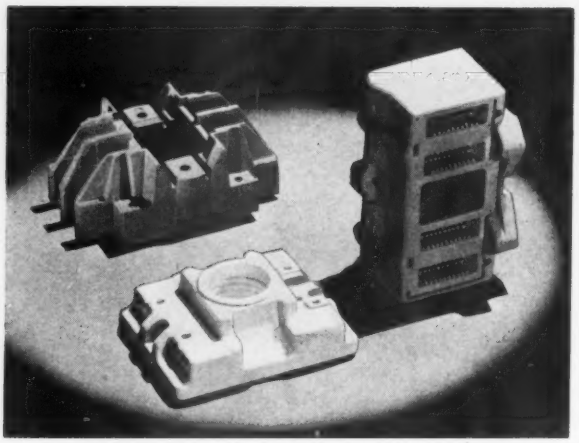

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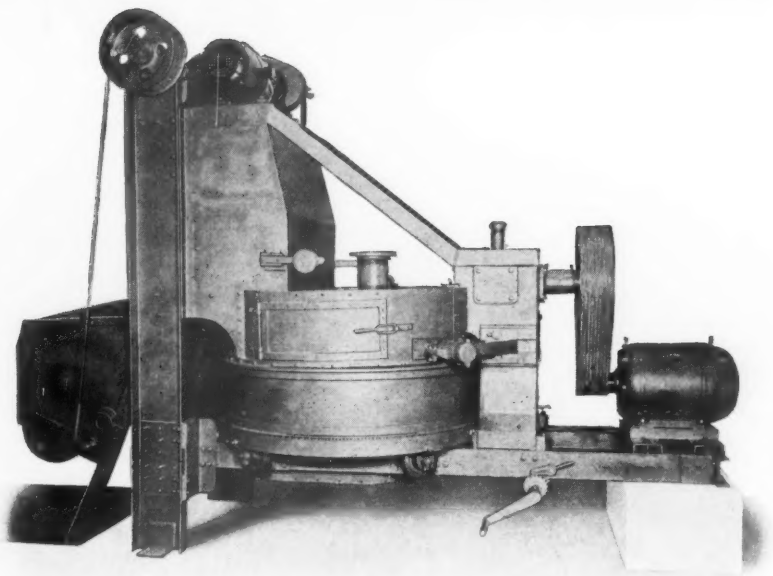

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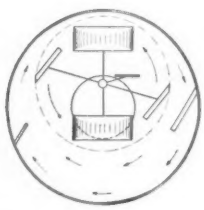

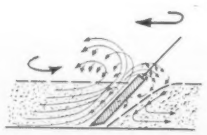

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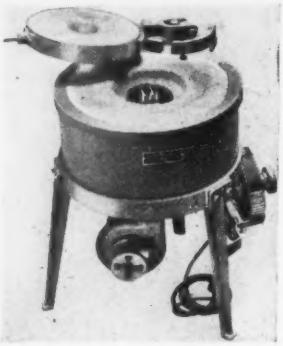

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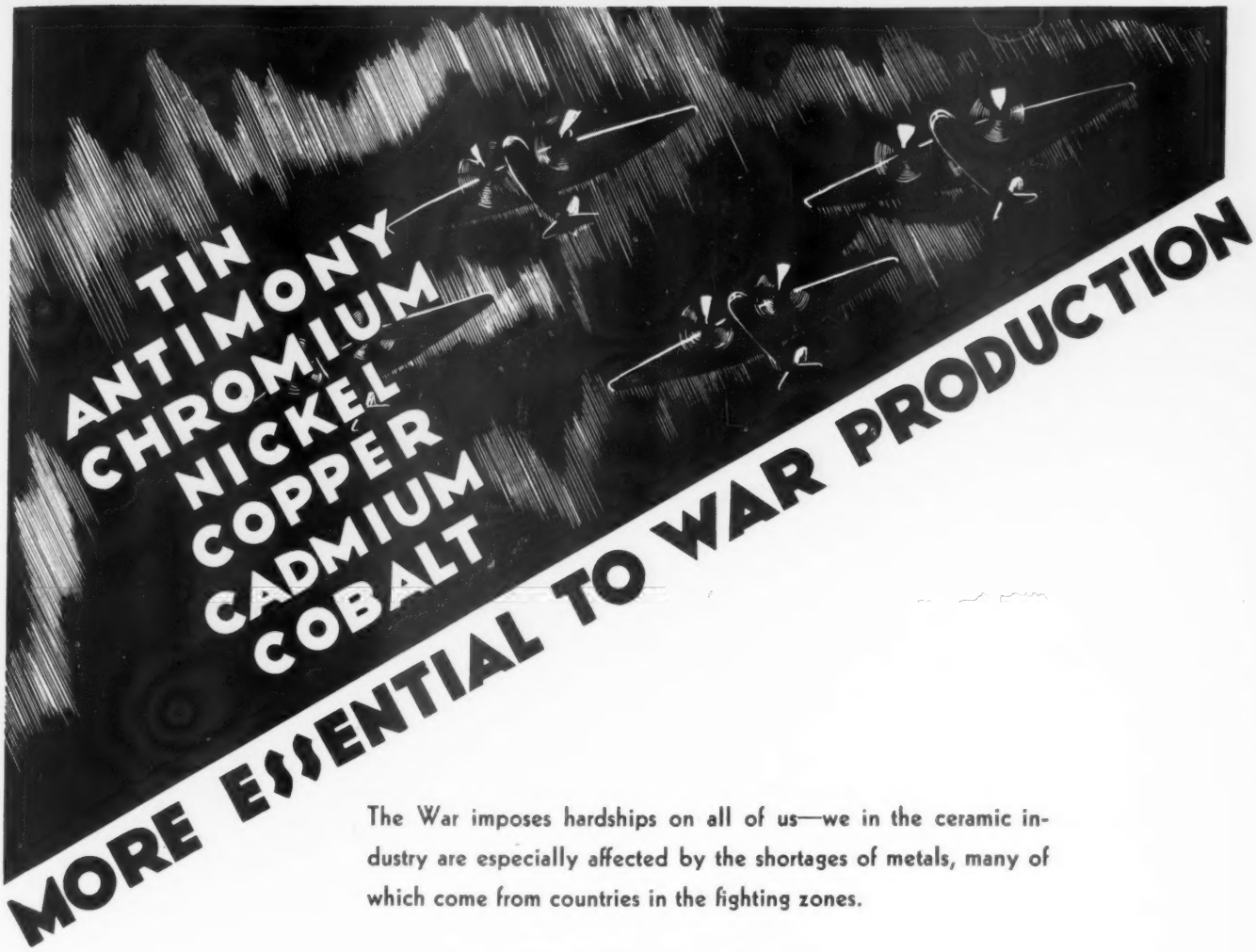

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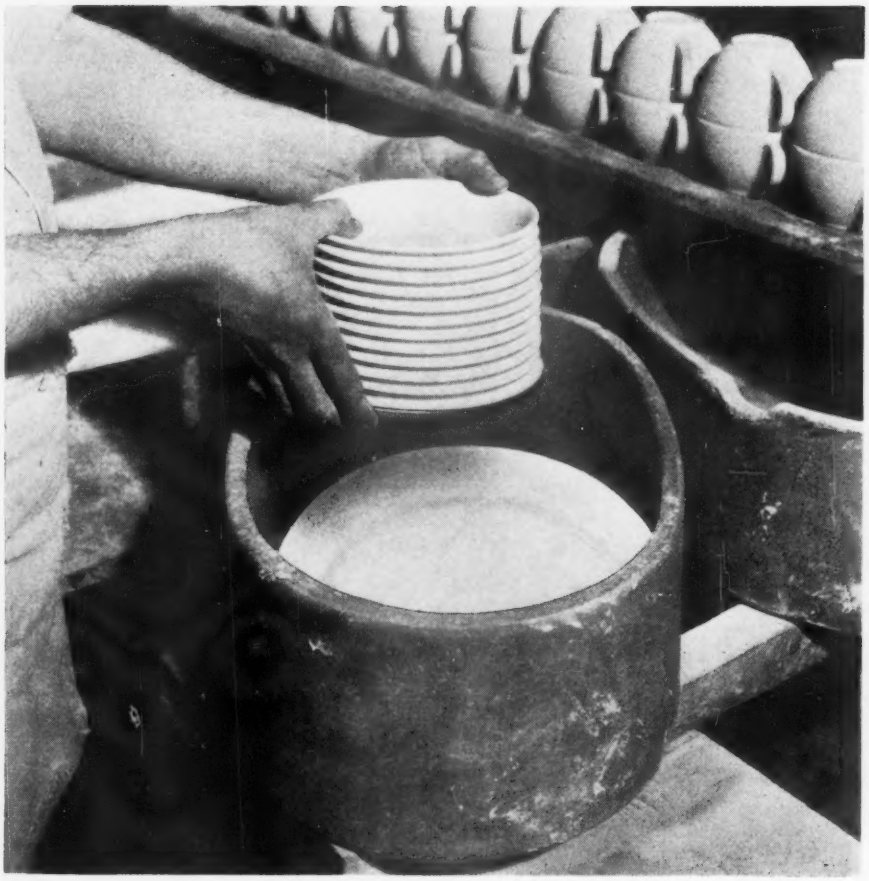

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Vol. 21 **May 15, 1942** **No. 5**

Abrasives

Coated abrasives—a tool. E. B. GALLAHER. *Metal Finishing*, **40** [1] 51–56 (1942).—Coated abrasives comprise abrasive materials which have been crushed and graded accurately into prescribed sizes and then applied with a suitable binder to papers and cloths for industrial purposes. Coated abrasives are thought to be chiefly employed in finishing and polishing operations on wood, metal, plastics, etc. Although they are used extensively for finishing these materials, their more important function is the shaping or cutting to size of thousands of pieces that otherwise would have to be machined on a machine tool. This industry has developed rapidly with the advent of electric-furnace abrasives. Applications of coated abrasives to leather cutting and plywood and metal finishing of various kinds are listed with a discussion of cutting speeds, pressure on work, and types of sanders in use. H.K.R.

Flexible shafts for grinding and polishing machines. A. G. AREND. *Power Transmission* [London]; reprinted in *Can. Machinery*, **52** [10] 129–30 (1941).—The use of flexible shafts for grinding and polishing wheels has developed rapidly because of the ease with which they can be manipulated, the small space they occupy, and the wide variety of conditions under which they can be used. E.D.M.

Grinding small lots by the centerless grinding method. R. W. PEASLEE. *Can. Machinery*, **52** [10] 73–74, 76 (1941).—Although primarily a mass-production operation, centerless grinding may profitably be used for short runs of small quantities (25 to 500). Long slender pieces can be ground more accurately than between centers. The material may be steel, plastic, copper, brass, bronze, or aluminum. The costs of centerless and cylindrical grinding are compared. E.D.M.

SEPARATE PUBLICATION

Carboloy Working Manual. Published by Canadian General Electric Co., Ltd., Carboloy Division. Reviewed in *Can. Machinery*, **53** [2] 138 (1942).—Carbide-tool design, grinding, application, tool control, lubricants, etc., are discussed. Illustrated. E.D.M.

PATENTS

Abrading machine. A. C. BURLEIGH. U. S. 2,276,534, March 17, 1942 (Nov. 2, 1940).

Abrading tool and method of making. ALN CIN, INC. Brit. 542,975, Feb. 18, 1942 (Sept. 21, 1939).

Abrasive bodies and bond mixtures therefor. NORTON GRINDING WHEEL CO., LTD. Brit. 542,825, Feb. 11, 1942 (Jan. 22, 1940).

Abrasive cutting wheel. H. V. ALLISON (Allison Co.). U. S. 2,275,339, March 3, 1942 (Feb. 8, 1941).

Abrasive tool. A. K. JOHNSON. U. S. 2,275,766, March 10, 1942 (June 12, 1941).—An abrasive tool comprising a flexible tubular abrasive member and cooperating wedges insertable therein to stretch the member.

Apparatus for grinding gear teeth. ERICH PARZ (Deutsche Niles Werke A.-G.). U. S. 2,275,804, March 10, 1942 (June 14, 1939).

Bonded abrasive. R. C. SWAIN AND D. W. LIGHT (American Cyanamid Co.). Can. 403,025, Feb. 24, 1942 (Jan. 25, 1940; in U. S. March 10, 1939). G.M.H.

Crankpin grinder. E. S. HANSON, JR. U. S. 2,275,757, March 10, 1942 (June 9, 1941).

Drill-grinding fixture. C. H. BERG. U. S. 2,275,496, March 10, 1942 (Sept. 27, 1940).

Forming of grinding wheels for grinding V grooves therein. CHURCHILL MACHINE TOOL CO., LTD., AND H. H. ASBRIDGE. Brit. 542,918, Feb. 11, 1942 (April 11, 1941).

Grinding apparatus. R. B. PARKER (Sullivan Machinery Co.). U. S. 2,275,483, March 10, 1942 (Jan. 15, 1937).

Grinding machine. FERNAND TURRETTINI (Soc. Genevoise d'Instruments de Physique). U. S. 2,276,260, March 10, 1942 (June 30, 1939).

Grinding and polishing machine. C. R. MOON (Ontario Mfg. Co.). U. S. 2,276,059, March 10, 1942 (June 13, 1940).

Honing device. K. W. CONNOR (Micromatic Hone Corp.). U. S. 2,276,611, March 17, 1942 (May 5, 1939).

Lapping machine. H. S. INDGE (Norton Co.). U. S. 2,275,061, March 3, 1942 (Feb. 8, 1939).

Lapping or polishing machine. T. C. JARRETT. U. S. 2,274,332, Feb. 24, 1942 (Jan. 30, 1939).

Manufacture of abrasive bodies. NORTON GRINDING WHEEL CO., LTD. Brit. 543,043, Feb. 18, 1942 (April 29, 1940).

Manufacture of abrasive-coated webs. R. L. MELTON (Carborundum Co.). U. S. 2,274,726, March 3, 1942 (April 13, 1940).

Method and means for forming a radius by a grinding operation. D. E. C. MAIR. Brit. 543,240, Feb. 25, 1942 (April 25, 1941).

Polishing wheel. H. R. BENBOW (Divine Bros. Co.). U. S. 2,274,185, Feb. 24, 1942 (Sept. 7, 1940).

Size regulator. DANIEL GURNEY AND M. A. HOLLENGREEN (Landis Tool Co.). U. S. 2,275,141, March 3, 1942 (Dec. 30, 1939).

Trimming mechanism for grinder wheels. I. J. GRUENBERG (Gear Grinding Machine Co.). U. S. 2,274,543, Feb. 24, 1942 (June 10, 1940).

Trimming mechanisms for grinding wheels. GEAR GRINDING CO., LTD., AND R. J. BULLOWS. Brit. 542,917, Feb. 11, 1942 (Feb. 22, 1941).

Wheel-dressing fixture. G. E. HEADBLOOM AND P. T. PETERSON (Apex Broach Co.). U. S. 2,274,959, March 3, 1942 (June 13, 1939).

Work holder for use on a metal-cutting or grinding machine. REYNOLDS TUBE CO., LTD., AND E. A. REYNOLDS. Brit. 542,866, Feb. 11, 1942 (Feb. 5, 1941).

Art and Archeology

Artistry in American-made glass. ANON. *Amer. Glass Rev.*, **61** [19] 9 (1942).—Three American designs (an epergne and two console sets) are illustrated. A.P.

Breakfast services. MICHAEL BIRKENBIHL. *Sprechsaal*, **74** [8] 69–72; [9] 85–88 (1941).—Soup was the usual breakfast before the 17th century. The introduction of chocolate, coffee, and tea presented new problems to ceramists. From the end of the 17th century, the demand for porcelain cups and pots increased. A set of ware for coffee, tea, or chocolate is known as a "breakfast service." In connection with the history of styles in breakfast services, 16 illustrations are given showing ware produced at the government porcelain factories at Meissen, Berlin, and Nymphenburg. W.H.H.

Ceramicenter and America House. HELEN DURNEY. *Design*, **43** [4] 25 (1941); *Bull. Amer. Ceram. Soc.*, **20** [9] 320 (1941).—D. discusses the organization and aims of two New York groups whose purpose is to provide an outlet for the work of ceramic artists and craftsmen. L.S.

Ceramic sculpture. WAYLANDE GREGORY. *Design*, **43** [4] 12 (1941).—The spirit of ceramic sculpture expression is essentially the direct creative urge to speak in the most responsive of all sculptural media, clay. Ceramic clay is a most exacting medium of sculptural expression. The material is abundant and ordinary but also capricious, and much of the fascination of the art is due to the uncertainty attending its pursuit. Illustrated. L.S.

Ceramics in public schools. ANON. *Design*, **43** [4] 23 (1941).—The work of pupils from kindergarten to high school in the public schools of Minneapolis and St. Paul, Minn., is presented in illustrations. L.S.

Clay pictures. MAXINE H. JONES. *Design*, **43** [2] 21 (1941).—Illustrations of clay figures made by sixth-grade pupils of the Tyler School, Cedar Rapids, Iowa, are presented. L.S.

Design in art objects. ANON. *Design*, **43** [3] 14 (1941).—In an exhibition at the Albright Art Gallery, Buffalo, N. Y., conducted in cooperation with the public schools, good and bad examples of articles of everyday use were placed side by side with explanatory matter. Illustrated. L.S.

Destiny of the Dresden porcelain collection. From the Saxon Electorate Art Gallery to the Zwinger State Porcelain Gallery: I. F. FICHTNER. *Ber. Deut. Keram. Ges.*, **20** [7] 293–309 (1939).—Collections as well as individual works of art have their own interesting history and show the development of culture. Porcelains were first collected because they were rare and expensive. Later the motive in collecting was pride in the nation's art and interest in native materials and the classical forms imparted to them. The history of the Dresden porcelain collection may be divided into five parts, of which the first three are considered in Part I of this paper. The art gallery (1590–1694) was for the benefit of individuals, the porcelain cabinet and the porcelain castle served a court company, the porcelain museum is mainly of interest to connoisseurs and collectors, while the national museum for ceramics is for the whole German nation. The spread of Asiatic porcelain throughout the world furnishes one of the most interesting chapters in the history of trade and art. Trustworthy information concerning porcelain was first obtained in the 13th century from the writings of Marco Polo. After the discovery of the direct sea route to the East Indies in 1498, Portugese and Dutch ships brought large amounts of porcelain of the Ming period to Europe, and some of this was acquired by the Dresden art museum. An inventory of the year 1595 and later inventories are still preserved. Around 1700, no princely castle was complete without a porcelain cabinet. Porcelain, as a new kind of art, became prominent and was a means of the development and representation of the late baroque style. The porcelain pavilion in Versailles (1670–1672) was the model for the porcelain cabinet in Dresden. While the cabinet has been rearranged at various times, the contents have in general remained unchanged and are of astonishingly high quality. The collection is placed too high, the lighting is poor, and it is known to few. It comprises mainly Chinese, Japanese, and Meissen porcelains. The Japanese porcelains are of average quality, but the Chinese are exquisite. The significance of the cabinet lies in the large number of rare Meissen vases, painted with fired colors, of the years 1720–1730. The porcelain castle differed from similar collections in other cities in that the porcelains were arranged in scientific groups instead of being mixed together or arranged from an aesthetic standpoint. Plans for the castle were made gradually; in 1717 the art collections were divided and placed in separate institutes, such as those for antiques, coins, engravings on copper, paintings, and natural-history specimens. The porcelains were housed in the Holland Palace. In 1717 also occurred the celebrated exchange of 600 Saxon horsemen for Chinese porcelains from Oranienburg and Charlottenburg, including many covered "dragon" vases, 105 cm. high, with cobalt decorations under the glaze, from the time of the emperor K'ang Hsi. For Part II see *Ceram. Abs.*, **21** [1] 3 (1942). W.H.H.

Exhibition of Contemporary Ceramics of the Western Hemisphere. ANON. *Design*, **43** [4] 4, 5, 10–11, 13–21, 24 (1941).—Descriptions and illustrations are presented. See "Craftsmen . . . ," *Ceram. Abs.*, **21** [3] 56 (1942). L.S.

Goethe and the porcelain industry. ANON. *Keram. Rundschau*, **49** [3] 27–28 (1941).—The personal and business relations of the German poet in his position of state official and his influence on the Sachsen-Weimarischen Porzellan-Fabrik are described. Some of the products of this factory at the end of the 18th and the beginning of the 19th century are reproduced. M.H.

New understanding of colors. HOWARD KETCHAM. Presented before New York Society of Ceramic Arts, March, 1942; abstracted in *Bull. Amer. Ceram. Soc.*, **21** [3] 45 (1942).

New York Society of Ceramic Arts. ANON. *Design*, **43** [4] 2 (1941); *Bull. Amer. Ceram. Soc.*, **20** [9] 320 (1941).—

A résumé of the history and the purpose of the Society is presented, with a description of its 41st annual exhibition. See "History . . . ," *ibid.*, **19** [1] 45–46 (1940). L.S.

Outline of American ceramics. ANON. *Design*, **43** [4] 6–7 (1941).—The development of the ceramic arts closely parallels the known history of mankind. A large part of the knowledge of prehistoric peoples has been obtained from inscriptions and subjects depicted on vases, tablets, brick, tile, and other forms of fired clay. The earliest potteries in the U. S. were started for commercial purposes by farmers who made earthenware in their spare time. The first recorded pottery was started by Daniel Coxe at Burlington, N. J., in 1684. The earliest known piece of American stoneware is a jug dated 1775; it bears the mark of J. C., believed to stand for John Crolius. John Remmey established a pottery in New York in 1735. Captain John Norton started making pottery at Bennington, Vt., in 1793. By 1825, pottery was being produced in quantity at a low price, and the art standards were low. There was little awareness of ceramics as an art until the early years of the 20th century. Illustrated. L.S.

Potter's art. CARLTON ATHERTON, CHARLES M. HARDER, AND GLEN LUKENS. *Design*, **43** [4] 3 (1941).—Each author explains his idea of how pottery differs from other media of art expression and comments briefly on the importance of the potter's art to civilization. L.S.

Pottery. RUTH ECKERLEY. *Design*, **43** [2] 18 (1941).—E. describes the making of a simple flowerpot from a plaster mold. Where no kiln is available, she suggests coating the piece with shellac, firing it 2 or 3 hr. in an ordinary oven, and decorating it with enamels. The project is recommended for high-school students. L.S.

Protecting valuable church windows. WALTER OBST. *Sprechsaal*, **74** [7] 60 (1941).—Many valuable church windows have been damaged by weathering, moisture, and other influences. Glass is not as stable as ordinarily supposed. Soluble salts are formed which are washed off by the rain or condensation; this spoils the decoration and weakens the glass. Glass, like metal, has a patina which is prized because it softens and harmonizes the colors, but it may help to weaken the glass. K. Würth found that the patina consisted mainly of lead sulfate, formed from lead in the glass and sulfur in industrial gases. He has applied for a patent on the use of a lac made from acrylic resin. Where church windows need to be strengthened as well as protected from the weather, a sheet of clear glass in addition to the coat of resin may be placed over the colored-glass window. See "Synthetics . . . ," *Ceram. Abs.*, **21** [1] 4 (1942). W.H.H.

Adelaide Alsop Robineau. ANON. *Design*, **43** [4] 8–9 (1941).—In 1903 Adelaide Alsop Robineau decided to learn how to make pottery. Up to that time she had been a leader among china painters. She studied for a few weeks at Alfred University, opened her own studio, and soon after started a small pottery in Syracuse, N. Y. She was known for the development of beautiful crystalline glazes, for her use of excising in decoration, and for her many fine porcelains. It was as a fitting tribute to this great personality that the annual ceramic exhibitions were instituted at the Syracuse Museum of Fine Arts by Anna W. Olmsted, director. Illustrated. L.S.

Vitamin A(rt). CLIFTON GAYNE, JR. *Design*, **43** [4] 22 (1941).—Clay is perhaps the most universal of art materials. It has many classroom uses in addition to providing legitimate ceramic objects for decorative purposes. As ideas for elementary-school children must be made as graphic as possible, clay models have infinite possibilities in connection with almost any unit of teaching. The elementary school is the place to begin the development of a sensitivity to the qualities of design and craftsmanship. Illustrated. L.S.

Why work in ceramics. ANNA W. OLMSTED. *Design*, **43** [4] 20–21 (1941).—The reasons of several artists for working in ceramics are given. One of the results of the increased interest in ceramics in the last 10 years has been the discovery of clays in many sections of the country which are of great importance industrially. Through increased interest in ceramics, native craftsmen in remote sections of the U. S. have been reached by teachers. Many of these craftsmen have become self-supporting by learning new methods and having their interest and imagination aroused through instruction. L.S.

SEPARATE PUBLICATION

Old Wedgwood, 1940. JEAN GORELY, editor. Wedgwood Club, 7 Fuller Rd., Wellesley Hills, Mass. Vol. 7. Price $1.25 to nonmembers. Reviewed in *Connoisseur*, **107** [477] 215 (1941).—The following subjects are discussed in this volume: (1) Jean Baptiste Nini, whose terra-cotta relief portrait of Benjamin Franklin in a fur cap was followed by Wedgwood and Bentley for a series of medallions in basalt and jasper ware; he was an Italian, head of the Chaumont glass and pottery works, and a personal friend of Franklin; (2) an account of "subtletys" and "conceipts"; and (3) the pineapple motif in the 18th century, which was probably first used as a decorative motif for pottery by Wedgwood. Illustrated. **1941**. Vol. 8. 102 pp., 16 illustrations.—This volume includes the following articles: (1) Brontë series of commemorative plates, by H. Bernard Robinson; (2) Glazes and their distinctions, by Robert N. Hudspeth; (3) Classic revival and Wedgwood's part in it, by Mrs. Robert D. Chellis; (4) Benjamin Franklin's English friendships, illustrated with Wedgwood portrait medallions, by R. T. H. Halsey; (5) Drinking and pouring vessels before and after the introduction of tea, by Mrs. Bertram K. Little; and (5) Etchings and aquatints on pottery in the 18th century. Museum notes are also given. The Wedgwood Club was founded nine years ago to foster an interest and appreciation in early English ceramics, particularly old Wedgwood ware. Membership is restricted to collectors and students who are not dealers, and members are to be found in many parts of this country, Canada, Mexico, and England. The Club meets from October to May, inclusive, on the last Saturday of the month, usually in the historic Old State House in Boston. The events and accomplishments of each year together with other material of interest to the collector are published annually. M.E.P.

PATENTS

Designs for:

Bottle. BORDEN CO. Can. 13,213, Jan. 14, 1942. UNITED DISTILLERS, LTD. Can. 13,226, Jan. 26, 1942. G.M.H.

Combination tumbler and toothbrush holder. HENRY DREYFUSS (Crane Co.). U. S. 131,507, March 10, 1942 (Nov. 6, 1941).

Glass bottle. A. C. MEYER (Glenshaw Glass Co.). U. S. 131,619, March 17, 1942 (Sept. 12, 1941).

Robe hook. HENRY DREYFUSS (Crane Co.). U. S. 131,503, March 10, 1942 (Nov. 6, 1941).

Soap dish. HENRY DREYFUSS (Crane Co.). U. S. 131,504, March 10, 1942 (Nov. 6, 1941).

Toothbrush holder. HENRY DREYFUSS (Crane Co.). U. S. 131,505, March 10, 1942 (Nov. 6, 1941).

Towel bar. HENRY DREYFUSS (Crane Co.). U. S. 131,506, March 10, 1942 (Nov. 6, 1941).

Cements

Blast-furnace slag aggregates in building and road construction. T. W. PARKER. *Chem. & Ind.*, **60** [5] 59–63 (1941).—P. gives an extensive review of the uses of blast-furnace slag as a heavy aggregate in concrete and in macadam construction. The compositions of most slags vary from 32 to 52 CaO, 1 to 9 MgO, 26 to 36 SiO_2, and 10 to 22% Al_2O_3; the minor components of slags include FeO, MnO, TiO_2, S, and alkali. The quaternary system

CaO–MgO–SiO_2–Al_2O_3 is the basis upon which the crystalline phases of the slag can be determined. Gehlenite ($2CaO \cdot Al_2O_3 \cdot SiO_2$) and akermanite ($2CaO \cdot MgO \cdot 2SiO_2$) form a series of solid solutions known as melilites, and petrographic analysis shows that melilite is usually the principal constituent of slags. The crystalline inversion of $2CaO \cdot SiO_2$ causes disintegration, on cooling, of slags in which this compound is present. In the case of a slag to be used as a heavy aggregate, the aim is to produce a stable, dense, solid product with a stony texture; the CaO content should be kept as low as possible. These requirements are met by adjusting the slag composition. The raw materials regulate the slag composition; dolomite may be substituted in part for limestone, and sand may be added to increase acidity. The cooling procedure affects the density, and proper cooling may eliminate honeycombing. The powder density of slag is 3.0, and 1 cu. ft. should weigh 70 lb. Acid slags have a tendency to become vitreous, and slow cooling is necessary to develop a crystalline texture. Basic slags crystallize readily. Methods of cooling are discussed. Slag has merits as a heavy aggregate in concrete and in macadam structures, and it is desirable to produce slag as a marketable product rather than as a by-product to be discarded.

R.H.B.

Blending cement raw materials to control chemical composition. BROR NORDBERG. *Rock Products*, **45** [1] 46–49, 102 (1942).—Because of the considerable variation in chemical composition of raw materials, special precautions must be taken to insure a batch of the desired composition. Diaspore is used to raise the alumina content when clays become too siliceous.

B.C.R.

Firing temperature of talc chlorite and asbestos cement. K. I. CHERNYAK. *Vestnik Elektroprom.*, **10** [12] 33–34 (1939); abstracted in *Chem. Zentr.*, **1941, I,** 945.—Comparison tests on talc chlorite and asbestos cement gave the following results: water absorption capacity after 24 hr., 0.14% and 15%, respectively; resistance to pressure, 300 and 800 kgm. per sq. cm.; transverse strength, 250 and 300 kgm. per sq. cm.; impact strength, 0.5 and 4 to 6 kgm. cm./sq. cm.; electrical stability, 3 and 2 kv. per mm. Six-hour firing tests at 100° to 1300° showed that at ≥ 800° the volume of the talc chlorite shrank considerably. At 600°, the mineral lost its water of crystallization and became very porous. The hygroscopicity increased from 0.08% to 0.32% at 500° and reached 1.27% at 600°. The water absorption capacity increased about 4.57% between 500° and 600°. The resistance to pressure increased to 864 kgm. per sq. cm. after 2 hr. at 900° to 1000°, while at 600° the transverse strength was at a minimum; at 1200° it increased to 225 kgm. per sq. cm. The impact strength remained unchanged up to 700°, and at 1100° it was 1.26 kgm. cm. per sq. cm. The behavior of asbestos cement is a little better at high temperatures.

M.V.C.

Enamel

Boron-free colored enamels for sheet and cast iron: II (continued). H. LANG. *Keram. Rundschau*, **48** [39] 322–24 (1940).—The production of black boron-free enamels for sheet and cast iron presents difficulties because of the appearance of defects such as discoloration, iridescence, dullness, white tarnish, etc. The black coloring of enamels is produced by mixing several dark-colored metal oxides, e.g., cobalt, nickel, copper, and manganese oxides. Their action in boron-free enamels is unpredictable chiefly because of the large soda content, which should be replaced if possible. Boron-free blue and violet enamels have the same defects as black enamels; the darker the colors required and the cheaper the coloring substances, the more difficult they are to obtain. Cobalt oxide causes the least trouble. Some boron-free colored enamels, both opaque and transparent, are not difficult to produce even when they contain a large amount of soda, viz., gray enamels (discussed in Part I); green, with chrome oxide as pigment; yellow, produced by antimony compounds; and brown, produced by iron oxide. **III, Composition and structure of boron-free colored enamels.** *Ibid.*, [41] 334–35; [43] 356–57.—A boron-free enamel must possess certain properties. In general, these enamels are always more viscous than borax enamels during melting, but they are often not as homogeneous. Threads drawn from the melt are never quite smooth, and they show knots; this makes it more difficult to ascertain the end of the melting period, especially where borax has been replaced by soda, fluorides, phosphates, etc. Knots do not occur, however, if products which have been already melted (glass powder) are substituted for borax. The softening and melting points of boron-free enamels lie very close together and often practically coincide, which also makes it difficult to recognize the end of the melting period. Unlike borax enamels, boron-free enamels may be improved in opacification and covering power by being held longer in the melting furnace. The enamels lose their brightness, however, and become dull, porous, and often unfit for their intended purpose. The color tints are often not uniform. These disadvantages can be eliminated by making the enamel flux more vitreous. Cerium oxide seems to be the best opacifier for boron-free enamels. A satisfactory black enamel has the following composition:

Feldspar	42	32.55
Quartz	16	12.40
Glass powder	36	27.91
Soda	12	9.31
Fluorspar	12	9.31
Manganese oxide	8	6.20
Black body	3	2.32
	129	100.00

The coloring substance must be intimately mixed with the enamel. For Parts I and II see *Ceram. Abs.*, **21** [4] 76 (1942).

M.V.C. + M.H.

Cause of defects in enamel fired on cast iron at temperatures above 725°C.: I. C. A. ZAPFFE. *Jour. Amer. Ceram. Soc.*, **25** [7] 175–80 (1942).—7 figures. **II, Scratch blisters.** C. A. ZAPFFE AND J. L. YARNE. *Ibid.*, pp. 180–90.—12 figures. **III, Relation of surface oxidation to certain defects in enamel coatings on steel.** *Ibid.*, pp. 191–94.—5 figures. **IV, Chips, fish scales, and shiners.** *Ibid.*, pp. 194–203.—14 figures. **Discussion.** KARL KAUTZ. *Ibid.*, pp. 203–204. **Reply.** C. A. ZAPFFE AND J. L. YARNE. *Ibid.*, pp. 204–205. **V, Further considerations of hydrogen as a cause of enamel defects.** C. A. ZAPFFE AND C. E. SIMS. *Ibid.*, pp. 205–15.—16 figures, 35 references. See "Hydrogen . . .," *Ceram. Abs.*, **21** [1] 5 (1942).

Clay-refining plant. ANON. *Better Enameling*, **12** [12] 17, 20–22, 26 (1941).—A new method of clay preparation that does not depend upon dry grinding of the clay prior to bagging has been developed by the Chicago Vitreous Enamel Product Co. The process is essentially a clay washing or blunging operation which avoids any reduction in particle size of the contaminating materials. This is followed by screening, magnetic separation, drying, and bagging, resulting in a dry powdered clay from which foreign material has been removed without changing the salt content of the clay, which is so essential to set.

B.C.R.

Crazing in boron-free enamel for cast iron. ANON. *Sprechsaal*, **74** [4] 30–31 (1941).—Crazing is a common fault, even in the best majolica enamels. It has been increased by the change to boron-free enamels. With the introduction of lead-free enamel, crazing was caused mainly by using too much borax, barium carbonate, etc.,

and by reducing the silica content too greatly. It was decreased or eliminated by using higher temperatures. The following formula was used as a starting point for developing a boron-free enamel: feldspar 40, quartz 12, barium carbonate 14, soda 22, fluorspar 7, saltpeter 2, and opacifier 3. This enamel showed crazing very quickly. The following enamels were prepared with a reduced amount of soda:

	A	B
Feldspar	40	40
Quartz	18.5	18
Barium carbonate	14	14
Soda	10.5	8.5
Fluorspar	12	9
Zinc oxide		6
Saltpeter	2	2
Opacifier	3	3.5

Enamel *A* was noticeably harder than the original enamel; at the same firing temperature (800° to 820°C.) the working period was longer, and the enamel showed a wavy surface. Satisfactory results were obtained by raising the firing temperature to 860° to 900°C. The difficulties were insignificant, and the enamel surface was improved in smoothness and luster. The decrease in crazing was most important. Enamel *B*, containing zinc oxide, was more fluid than enamel *A*. Its covering power was less, and the opacifier had to be increased from 3 to 3.5. There was so little crazing that this enamel could be said to be free from crazing. The decrease in soda and especially the introduction of zinc oxide produced these favorable results. The characteristics of the cast iron are also important. Calculations are often made regarding the expansion of the enamel when little or nothing is known about the expansion of the cast iron. In some spots on the cast iron, e.g., where there was a sudden change in thickness, there was a greater tendency of the enamel to craze, but in all cases enamel *B* showed less crazing than enamel *A*. The use of higher temperatures caused some difficulty with "scorching" of the cast-iron surface, i.e., excessive oxidation caused the formation of a layer of black iron oxide, which tends to prevent good adherence of the enamel. To avoid such difficulties, it is generally advantageous to apply a ground coat. The ground-coat frit may be composed of quartz 78, soda 18, and fluorspar 4. The mill addition should consist of 15 to 25 clay, 15 to 25 quartz, and 5 to 10% soda. W.H.H.

England's use of enameling furnaces for heat-treatment. ANON. *Enamelist*, **19** [1] 5–7 (1941).—Part of the enameling-furnace capacity in England is being utilized for the heat-treatment of steel, i.e., for normalizing, box carburizing, and quench hardening. L.E.T.

Household cleaning powders scratch porcelain enamel. EVELYN SPARKS. *Enamelist*, **19** [3] 8–13 (1941).—Fourteen known commercial cleansers and a few other cleaning agents were tested to determine their abrasive action on two types of porcelain enameled cast iron and three types of enameled sheet iron. The results were tabulated as harsh, moderate, or gentle action. Sodium carbonate caused no abrasion whatever. L.E.T.

Molybdenum in enamels: II, Adherence produced with soluble and insoluble molybdates. KARL KAUTZ. *Jour. Amer. Ceram. Soc.*, **25** [6] 160–63 (1942); for Part **I** see *ibid.*, **23** [10] 283–87 (1940).

Porcelain enamel as a protective coating for hot-water tanks. D. R. GOETCHIUS. *Jour. Amer. Ceram. Soc.*, **25** [6] 164–68 (1942).—7 references.

PATENT

Opacifier for enamels. WALTER KERSTAN (Deutsche Gold- und Silber-Scheideanstalt vorm. Roessler). U. S. 2,275,261, March 3, 1942 (April 3, 1940).—An opacifying agent for enamels which comprises a mixture of 1 part of cerium dioxide and 6 parts of alkalized clay, the alkalized clay having been prepared by mixing enamel clay with an alkaline solution or suspension of an alkalizing agent selected from the group which consists of sodium hydroxide, potassium hydroxide, potassium carbonate, ammonia, and barium hydroxide and then drying the mixture.

Glass

Batch briquetting. WFL. *Keram. Rundschau*, **46** [32] 355–58 (1938).—To clear up conflicting opinions on batch briquetting, W. quotes recent literature on the subject and concludes that in the large-scale production of a single type of glass, especially where tank furnaces are used, batch briquetting shortens smelting time, improves the homogeneity of the batch, prevents loss through the scattering of dust during charging (which is also dangerous to health) or during transportation and storing, and is cleaner. The furnace can be charged more quickly and easily, and the life of furnace parts is lengthened. It is important, however, that the briquettes be manufactured (1) under high pressure (up to 240 kgm. per sq. cm.), (2) without the addition of bond, and (3) with little moisture content. For small plants or plants where changes in the type of glass manufactured must be made frequently, the cost makes briquetting unprofitable unless several plants can be located near a centralized briquetting plant. For pot furnaces, briquetting is suitable only where it is possible to keep the different types of briquettes in storage. M.V.C.

Bubbler tip of Pyrex brand glass for difficult absorptions. JOSEPH R. BRANHAM AND EDWARD O. SPERLING. *Jour. Research Nat. Bur. Standards*, **22** [6] 701–705 (1939).—A tip made of Pyrex brand glass is described for use in a gas-absorption pipette to divide the stream of gas into small bubbles to obtain a large surface of contact with liquid reagents. The tip is made by sealing a number of fine copper wires, radiating from a center in a definite pattern, between a cone formed on the end of a glass tube and a circular glass disk. After the glass parts are sealed together and ground to expose the ends of the wires, the wires are dissolved in warm nitric acid. Drawings illustrating the method of making the tips are included. The tips are very sturdy and, at moderate pressures, furnish small bubbles of uniform size and distribution.

Chemical method of reducing the reflectance of glass. F. H. NICOLL. *RCA Rev.*, **6** [3] 287–301 (1942).—A new chemical method of reducing the reflectance of glass is described. It is compared experimentally with previously known chemical methods and is shown to be superior in many respects. This method produces a tough, hard film of low reflecting power. The treatment involves exposure to hydrofluoric acid vapor and is applicable to large sheets of glass. The process requires neither vacuum nor expensive equipment and is suitable for many optical glasses. The possible uses of nonreflecting glass produced by this method are mentioned. Photographs are given of several examples of these applications, including cathode-ray tube faces, ground-glass screens on cameras, and glass covers for photographs and pictures. See "Etching . . .," *Ceram. Abs.*, **21** [1] 7 (1942); "Glass without . . .," *ibid.*, p. 8. J.L.G.

Colored glass—yellow color: II. BRUNO SCHWEIG. *Glass*, **18** [11] 314–16, 319, 322 (1941).—S. discusses methods of producing yellow coloration in glass with silver, cerium and titanium, uranium, vanadium, nickel, indium, mercury, praseodymium, chromium, antimony, copper, and tungsten. Numerous methods for producing greenish-yellow and reddish-yellow glasses are mentioned. See *Ceram. Abs.*, **21** [2] 38 (1942). B.C.R.

Concentration of sand for use in the manufacture of glass. V. M. VINOKUROV AND B. N. MOSKVIN. *Optiko Mekh. Prom.*, **7** [7] 1–6 (1937); *Chem. Zentr.*, **1939, I,** 5025; *Chem. Abs.*, **34,** 7555 (1940).—Investigation of various methods for the removal of Fe from sand to be used in the manufacture of glass showed the magnetic method to be most effective. By a combination of the

washing method with the method of magnetic separation, up to 60% of the Fe can be removed from many kinds of sand, e.g., those from Lushsk and Gorjkowsk.

Conductivity of glasses and crystals as a function of field strength. R. J. MAURER. Presented at National Research Council Conference, Washington, D. C., Oct., 1940; reviewed in *Elec. Eng.*, **60** [1] 23 (1941).—Soda-lime glass was chosen as the test material for electrolytic conductivity studies. The theory is that interstitial ions occasionally gain sufficient energy from their neighbors to jump to positions of equilibrium. From this, an equation for current density is derived, with functions of temperature and field strength, involving the "jump distance" of the ions. For glass, this distance was larger than expected and was affected by temperature. Good agreement with theory was found for crystalline quartz, except at low field strengths, while the jump distance for NaCl was one fourth as large as expected. See "Electric. . .," *Ceram. Abs.*, **20** [11] 260 (1941). R.L.G.

Corning Glass unit planned in West Virginia by Defense Plants Corp. ANON. *Amer. Glass Rev.*, **61** [19] 7 (1942).—At Parkersburg, W. Va., the Defense Plants Corp. will build a two to three million dollar optical-glass plant for the Corning Glass Works. A.P.

D.c.-a.c. correlation in dielectrics. J. B. WHITEHEAD AND G. S. EAGER, JR. *Jour. Applied Physics*, **13**, 43–49 (1942).—It has been proposed that the rise of continuous voltage due to the residual charge of a capacitator may be used for the computation of dielectric loss under alternating potential. A soda-lime glass capacitor gave reasonable agreement between measured and computed values, but two impregnated paper capacitors did not. A.P.

Depression-born fibrous glass, introduced late in 1931, begins its second unpredictable decade. ANON. *Amer. Glass Rev.*, **61** [21] 9, 14 (1942).—The early difficulties in finding uses for fiber-glass air filters in forced warm-air heating and air-conditioning equipment are traced. A.P.

Dictionaries make "glass" a verb. ANON. *Amer. Glass Rev.*, **61** [18] 9 (1942).—Five 1942 dictionaries list the meaning of glass in verbal form: "Glass, glassed, glassing—to put into a glass jar or jars, as to glass fruits or vegetables." A.P.

Electrical properties in relation to the chemical composition of glass. C. W. PARMELEE AND A. E. BADGER. Presented at National Research Council Conference, Cambridge, Mass., Nov., 1939; abstracted in *Elec. Eng.*, **59** [1] 36 (1940).—Recent measurements of the power factor of soda-lime glasses indicated that high-resistance glasses possess low power factors. No correlation could be found between either of these electrical properties and the equilibrium diagram. R.L.G.

Frosting of electric bulbs. TAMOHAR GUPTA. *Trans. Indian Ceram. Soc.*, **1** [1] 15–19 (1941).—There are two methods of frosting, mechanical and chemical. Chemical frosting produces a more even surface and is therefore preferable. Interior chemical frosting produces crevices on the surface which tend to widen under any pressure from the outside, thus reducing the mechanical strength of the bulbs. The strength lost can be restored by treatment with another solution. The strength of the solution, the temperature, and the time of exposure to the solution determine the opacity of the bulb.

Glass. ANON. *House Beautiful*, **82** [9] 32–34 (1940).—The present technique of glass blowing by craftsmen is practically unchanged from that used in Murano. After a brief analysis of the content of glass, the melting, blowing, tempering, and decoration of modern table glassware are described. Factory processes and patterns and designs are illustrated. M.E.P.

Glass from feldspar. R. CHARAN AND M. L. MISRA. *Trans. Indian Ceram. Soc.*, **1** [1] 20–24 (1941).—Feldspar from the Gaya district of Bihar is used as a partial substitute for soda ash in the glass batch. The introduction of a limited quantity of feldspar to the glass batch reduces the cost about 14%. This glass is suitable for the manufacture of bottles. See *Ceram. Abs.*, **20** [1] 12 (1941).

Glass fiber substitutes for cork, aluminum, and mica. ANON. *Amer. Glass Rev.*, **61** [19] 20 (1942).—Glass fiber, a new basic material made of ingredients plentiful in the U. S., is increasingly important in replacing such scarce strategic minerals as cork, aluminum, nonferrous asbestos, and mica. A.P.

Glass in parts design—its properties and applications. ANON. *Product Eng.*, **13** [1] 28–30 (1942).—The advantages often connected with the use of glass are elaborated. The dimensional accuracy of molded glass is about the same as that of iron cast in sand molds. Glass blown in iron molds is much more accurate, differences amounting to $\pm 1/32$ in. in length or $\pm 1/64$ in. in diameter. "Welding" of glass is easy, but glass parts to be joined should be closely identical in chemical composition and thermal expansion, as glass is not ductile and cannot stretch or cold-flow to accommodate differences in contraction. A new glassworking tool is briefly described which permits more rapid glass-to-glass welding with greater concentration of heat; it is based on the fact that glass changes from an insulator to an electrolytic conductor at high temperature, and high-frequency current is used through the glass. The heating velocity in this method can be 10 to 100 times that of the flame-heating method. The glazed surface of a mechanical part made from a hard glass has good corrosion resistance; it will withstand ordinary atmospheric attack for a year and the attack of ordinary tap water for several months. Glass rubbing surfaces must be lubricated to prevent scratching and tearing; water can be used for light loads, and oil, grease, or graphite for heavier loads. Thermal-shock resistance should be considered in using glass for machinery; the development of Pyrex and Vycor brand glasses, however, has made this factor unimportant. The thermal-expansion coefficient, which usually determines the thermal-shock resistance, is generally about the same as that of steel and cast iron: 3.3×10^{-6} for hard glass, 4.5×10^{-6} for thermometer glass, and over 5.5×10^{-6} for plate and crown glasses. The softening points of glass range from 1000° to 1500°F.; that of Vycor brand (96% silica) glass is about 2700°F. The modulus of elasticity ranges from 9.64 to 10.14 $\times$ 10^{-6} lb. per sq. in. The safe practical tensile and bending load is only 1000 lb. per sq. in. although the intermolecular strength is 500,000 to 1,000,000 lb.; as glass is completely nonductile, it cannot correct surface or internal cracks or defects, and the sensitiveness to notch effects and surface flaws is very great. The possibilities are further discussed from the viewpoint of fatigue; the given conditions for the type of glass to be selected should be considered. See "Glass for mechanical . . .," *Ceram. Abs.*, **21** [3] 59 (1942). M.H.

Insulating materials—high standard maintained in spite of war. A. R. DUNTON. *Electrician*, **128** [3322] 61–62 (1942).—Paper, silk, and shellac insulation are discussed. The use of impregnated glass insulation is noted. Glass insulation with a thickness of approximately 4.5 mils has an electrical breakdown value of approximately 1200 volts per mil when tested in the flat condition and a value of approximately 850 volts per mil when subjected to a tensile stress of 1 lb. per mil per in. width. One of the outstanding features of this new form of glass insulation is the remarkably high tensile strength, which in some cases is approximately 200 to 215 lb. per in. width for 5-mil tapes and 280 to 340 lb. per in. width for 11-mil tapes. See *Ceram. Abs.*, **20** [6] 141 (1941). H.K.R.

Methods of testing glass. OTTO HERFURTH. *Diamant*, **62** [23–24] 153–55; [32–33] 214–15 (1940).—H. describes simple chemical and physical testing methods by which necessary qualitative determinations can be made quickly without the help of a chemist and without a physical laboratory. By these methods it is possible to determine whether or not a glass contains lead, whether red coloring is due to gold or to copper, whether green coloring is due to Cr or Cu, the general composition (to ascertain if the glass is hard or soft), density, elasticity, heat conductivity, light transmission, and refractivity. M.H.

Progress in the glass industry in the U. S. FRITZ ECKERT. *Sprechsaal*, **74** [8] 72–75; [9] 88–91 (1941). W.H.H.

Properties of surface films of glasses. N. F. TIMOFEEVA. *Optiko Mekh. Prom.*, **8** [9] 19–20 (1938); *Chem. Zentr.*, **1939, II,** 343; *Chem. Abs.*, **35,** 3045 (1941).—The behavior of surface films varied according to their thickness. Thick films contain a great deal of water which they give up when heated to only 80°, while thin films lose their water only when heated above 400°. Thick layers crack upon drying; thin layers only contract. Experiments carried out with stearic acid gave similar results. In this case the surface layer was washed off with xylene. In the case of thin films, measurements of thickness gave a constant value; this indicates the formation of a film of unimolecular thickness (or a multiple of this). Washing off of the thick layers gave no constant value but proceeded nonuniformly.

Simplification of glass containers becomes a war necessity. ANON. *Glass Ind.*, **23** [2] 55–56 (1942).—A program for the simplification and standardization of glass containers was outlined to food packers at the National Canners Convention in Chicago. An "Economy Line Plain Round Jar" in only eleven sizes requires at least 25% less glass, saves 20 to 40% in closure metals, and permits most economical packing in paperboard shipping cases. Soda ash and fuel will also be conserved. A.P.

Surface tension of glass and its effect on cords. W. B. SILVERMAN. *Jour. Amer. Ceram. Soc.*, **25** [6] 168–73 (1942).—5 references, 2 figures.

Use of cullet—a review. ANON. *Glass Ind.*, **23** [2] 57–59 (1942). A.P.

Wanted: A new design in 30 days. CRESTON DONNER. Read before American Designers Inst., Chicago. Abstracted in *Amer. Glass Rev.*, **61** [17] 17–18 (1942).—Because of the war, flat-glass products are being used as substitutes for critical materials and as a means of providing for health and sustenance, e.g., by the modernization of existing dwellings to conserve light and fuel. Products of the Libbey-Owens-Ford Glass Co. include (1) polished plate glass for large unbroken areas, (2) sheet glass for larger window areas, (3) polished plate-glass mirrors, (4) heat absorbing, figured, and wire glass, (5) Thermolux, (6) toughened plate glass for doors, (7) opaque and luminous colored structural glass, (8) Glastone, a prefabricated masonry unit with a face of colored structural glass backed with Haydite concrete, and (9) invisible insulation with two or more panes of clear glass. A.P.

Washing precipitates in fritted-glass funnels. J. J. KOLB. *Chemist-Analyst*, **31** [1] 17 (1942).—Fritted-glass filtering funnels are advantageous over Büchner funnels in that they permit thorough washing and the precipitate may be left in the funnel during drying. A.P.

BOOKS

Chemical Engineer (Chemie Ingenieur): **Vol. III, Part 2.** A. EUCKEN AND M. JAKOB, editors. Akad. Verlagsges. m.b.H., Leipzig, 1938. Reviewed in *Angew. Chem.*, **52** [1] 47 (1939).—A chapter on glass and fused-silica ware by G. Schott is included. See *Ceram. Abs.*, **15** [11] 350 (1936). R.L.G.

Glass. MARY K. CHAPIN. Whitman Publishing Co., Racine, Wis., 1940. 24 pp., 34 illustrations. Price 10¢. —This book, intended for children, gives a brief history of glass, its manufacture, and its varied uses.

PATENTS

Apparatus for fusing silica. BRITISH THOMSON-HOUSTON CO., LTD. Brit. 543,159, Feb. 25, 1942 (Oct. 21, 1939).

Apparatus and method for controlling drift in lehrs. D. G. MERRILL (Hartford-Empire Co.). U. S. 2,275,263, March 3, 1942 (Oct. 5, 1938).

Drawing sheet glass. GEORG KILIAN AND ROBERT STROHSCHNEIDER (Deutsche Tafelglas Akt.-Ges. (Detag)). U. S. 2,274,986, March 3, 1942 (June 9, 1939).

Electric glassmelting furnace. JOHN FERGUSON. U. S. 2,276,295, March 17, 1942 (June 14, 1940).

Filamentous glass. GAMES SLAYTER AND J. H. THOMAS (Fiberglas Canada, Ltd.). Can. 402,775, Feb. 10, 1942 (May 22, 1939; in U. S. May 20, 1938). G.M.H.

Fining of glass. F. W. ADAMS (Pittsburgh Plate Glass Co.). U. S. 2,274,643, March 3, 1942 (Dec. 19, 1939).

Forming machine for hollow glassware. T. F. PEARSON (Crown Cork & Seal Co., Inc.). U. S. 2,275,231, March 3, 1942 (Sept. 7, 1937).

Glass-article manufacture. A. G. C. KIRCHHEIM (Soc. Anon. des Manufactures des Glaces & Produits Chimiques de St.-Gobain, Chauny & Cirey). Can. 403,137, Feb. 17, 1942 (May 30, 1939). G.M.H.

Glass fiber drawing and winding apparatus. PIERO MODIGLIANI (Fiberglas Canada, Ltd.). Can. 403,074, Feb. 17, 1942 (March 7, 1939). G.M.H.

Glass fiber gathering method. J. F. HYDE AND S. M. DOCKERTY (Fiberglas Canada, Ltd.). Can. 402,776, Feb. 10, 1942 (Jan. 12, 1940; in U. S. Jan. 13, 1939). G.M.H.

Glass fiber producing mechanism. STUART M. DOCKERTY (Fiberglas Canada, Ltd.). Can. 402,774, Feb. 10, 1942 (May 22, 1939; in U. S. May 24, 1938). G.M.H.

Glass-fiber production. GAMES SLAYTER (Fiberglas Canada, Ltd.). Can. 403,075, Feb. 17, 1942 (July 31, 1939; in U. S. Aug. 4, 1938). G.M.H.

Glass furnace. EMILE ROIRANT (Soc. Continentale d'Appareils Mécaniques pour la Verrerie S. A.). Can. 402,427, Jan. 20, 1942 (Dec. 8, 1937). G.M.H.

Glass-handling apparatus. WILLIAM OWEN (Pittsburgh Plate Glass Co.). U. S. 2,274,729, March 3, 1942 (Jan. 12, 1940).

Glass-to-metal seal. V. O. ALLEN (Wilbur B. Driver Co.). U. S. 2,274,999, March 3, 1942 (April 8, 1940).—As a new material for glass-to-metal seals, an alloy containing 26 to 28% chromium and between about 1 and 6% of a metal chosen from the group consisting of molybdenum, tungsten, and uranium sufficient to materially lower the coefficient of expansion of the chrome iron, the remainder of the alloy being iron.

Glass- or slag-fiber production. L. S. VELLO (N. V. Mij. tot Beheer en Exploitatie van Octrooien). Can. 402,574, Jan. 27, 1942 (Aug. 11, 1937). G.M.H.

Glass stock for electric melting. HENRY SNOW (Fiberglas Canada, Ltd.). Can. 402,515, Jan. 27, 1942 (Feb. 24, 1939; in U. S. Feb. 26, 1938). G.M.H.

Glass tank. A. W. DODGE (Hazel-Atlas Glass Co.). U. S. 2,275,010, March 3, 1942 (Jan. 15, 1940).—A repaired glassmelting tank comprising a tank bottom formed of partly eroded flux blocks, a heavier-than-glass grog in the eroded joints, and fragments of heavier-than-glass blocks embedded in the grog.

Glassware-blowing mechanism. E. G. BRIDGES (Lynch Corp.). Can. 402,787, Feb. 10, 1942 (Aug. 20, 1940). G.M.H.

Glass wool. GAMES SLAYTER AND J. H. THOMAS (Fiberglas Canada, Ltd.). Can. 402,514, Jan. 27, 1942 (Sept. 4, 1937; in U. S. Oct. 23, 1936). G.M.H.

Glassworking apparatus. D. E. GRAY, L. N. POND, AND W. C. WEBER (Corning Glass Works). Can. 402,766, Feb. 10, 1942 (July 15, 1939; in U. S. Aug. 12, 1938). G.M.H.

Hollow glass article manufacture. E. G. BRIDGES (Lynch Corp.). Can. 402,788, Feb. 10, 1942 (Aug. 20, 1940). G.M.H.

Hollow glassware manufacture. E. G. BRIDGES (Lynch Corp.). Can. 402,786, Feb. 10, 1942 (July 31, 1939). G.M.H.

Making hollow glassware. VACLAV HRDINA. U. S 2,276,399, March 17, 1942 (Dec. 14, 1938).

Making thin glass. C. W. HAZELETT. U. S. 2,276,615 March 17, 1942 (April 9, 1938).

Manufacturing articles. A. H. STEWART AND PETER KUCERA. U. S. 2,274,105, Feb. 24, 1942 (Oct. 12, 1938). —The method of controlling the cooling and shrinkage of molded glass articles having spaced optical surfaces of predetermined shape and contour to prevent distortion of

the surfaces which comprises subjecting all surfaces of a semiplastic glass blank to pressure in a mold having spaced surfaces of predetermined contour conforming to the desired contour of the optical surfaces and simultaneously forming a chilled skin of predetermined contour on the optical surfaces, simultaneously shaping and chilling the remaining surfaces of the blank intermediate the optical surfaces by contact with the metal of the mold to provide a chilled skin of desired viscosity thereon, maintaining a portion of the surface of the blank intermediate the optical surfaces at a substantially higher temperature, thereby to form a surface of less viscosity in a localized area of the blank intermediate the optical surfaces, thereafter removing the blank from the mold, and cooling the blank so that contraction of the glass within the body of the blank will be compensated by hotter glass in the localized area of lower viscosity surface.

Methods and apparatus for drawing glass tubing. BRITISH THOMSON-HOUSTON CO., LTD. (J. Ferguson) Brit. 543,172, Feb. 25, 1942 (Jan. 31, 1941).

Mold for shaping glass bulbs. MAX HEIM (Fernseh G.m.b.H.). U. S. 2,274,691, March 3, 1942 (July 20, 1940).

Multicellular glass manufacture. BERNARD LONG (Soc. Anon. des Manufactures des Glaces & Produits Chimiques de St.-Gobain, Chauny & Cirey). Can. 403,138, Feb. 17, 1942 (Nov. 29, 1939). G.M.H.

Multifocal ophthalmic lens. L. L. HOUCHIN (Revalens Co.). U. S. 2,274,142, Feb. 24, 1942 (Jan. 15, 1940). U. S. 2,274,143, Feb. 24, 1942 (Nov. 9, 1940).

Pressed tubular glass structure. EUGENE SCHWARZ (Mantle Lamp Co. of America). U. S. 2,274,096, Feb. 24, 1942 (Feb. 13, 1939).

Safety glass. B. J. DENNISON (Pittsburgh Plate Glass Co.). U. S. 2,274,672, March 3, 1942 (April 30, 1938).

Structural Clay Products

Civilian defense. ANON. *Architectural Forum*, **76** [1] 1–68 (1942).—The entire issue is devoted to a comprehensive and well-organized outline of civilian defense, with contributions of research by governmental agencies and studies of war experiences in other countries. Industrial blackout is of special interest to the ceramic industry. Problems presented by smoke, which is visible by night, and glow and glare control are discussed. Besides the rearrangement of the sequence of operations, if possible, so that glow-producing phases will occur during daytime, the use of louvred hoods, large sheds, and asbestos sheet baffles over kiln chimneys is suggested. One of the most difficult problems of camouflage is the dissipation of shadows. Building protection is of special interest to ceramists because, of the various types of revetments used, brickwork, sand-filled hollow tile, and concrete blocks have been the most satisfactory under actual raid conditions. A favored material for air-raid shelters is reinforced brick, which seems to have greater resistance to blast and splinters than concrete; it also saves metal. The advantages of ceramic building materials are obvious for first-aid decontamination stations where walls, floors, and ceilings should be finished with materials which will withstand constant hosing and scrubbing with chloride of lime. Illustrated. M.E.P.

PATENTS

Cored brick. E. A. STEWART. U. S. 2,276,431, March 17, 1942 (Aug. 11, 1939).

Die for making interlocking brick. R. M. BENDER. U. S. 2,276,456, March 17, 1942 (April 8, 1940).

Making mosaic. J. A. MADALA. U. S. 2,274,907, March 3, 1942 (May 31, 1941).—The process of making mosaic comprising forming a clay block, forming a desired design in the upper portion of the clay block with substantially deep grooves separating areas, placing cement in the grooves, covering the upper design-bearing portion of the clay block with a high-temperature cement, turning the new block so formed upside down with the backing as a bottom support, cutting away the now upper excess portion of the clay block down to the inner ends of the areas bound together by the cement, and firing the article so formed for the finished mosaic.

Waterproof brick wall. JOHN A. POROMA. Can. 402,460, Jan. 27, 1942 (Feb. 22, 1940). G.M.H.

Refractories

Bauxite in India. ANON. *Times Trade & Eng.*, **50** [934] 16 (1942).—In connection with military requirements, plans are being carried out for utilizing bauxite in the Central Provinces, Bihar, and other parts of the country for the production of aluminum. Some time must elapse before the plans can be realized, but in the meantime factories for smelting imported alumina are being built by local subsidiaries of the British Aluminum Co. and the Aluminum Co. of Canada. A.B.S.

Getting the most out of modern refractories. J. B. AUSTIN. *Metal Progress*, **39** [1] 43–46 (1941).—Papers presented at a meeting of the Refractories Division, American Ceramic Society, Sept., 1940, and at a symposium on "Acid, Basic, and Neutral Refractories," sponsored by the Chicago Section of the American Ceramic Society and the Department of Ceramic Engineering of the University of Illinois, are reviewed. B.C.R.

Magnesite in central Australia. ANON. *Times Trade & Eng.*, **50** [935] 13 (1942).—Deposits of magnesite which may prove to be the largest in the world have been discovered in a district 370 miles north of Adelaide. If the mineral can be worked, using electric power obtained from Leigh Creek coal and from water drawn from neighboring water holes, the district may develop into an industrial center. The chief problems associated with the commercial exploitation of the field are the cost of transportation and the lack of an adequate water supply, but the Government is considering plans for working the deposits. A.B.S.

Refractories, an important key industry. ANON. *Times Trade & Eng.*, **50** [935] 38 (1942).—In the present war, the manufacture of refractory materials is one of the most important industries. Without furnace linings sufficiently resistant to heat and to the corrosive effects of slags and furnace gases, metals could not be smelted in the enormous quantities now required. Most of the abrasives employed for the cutting and shaping of metals, etc., are refractories, produced artificially at an exceedingly high temperature in electric furnaces. Synthetic refractory mixtures are being increasingly used in foundries. Firebrick is the most important refractory material at present; it meets the industrial demands for a heat-resisting material usable at temperatures up to 1400°C. and higher. For the roofs of some steel-producing furnaces, for coke ovens, and for some metallurgical hearths, brick made of almost pure silica are the most suitable. Their expansion when heated is slight, and they are resistant to certain slags and furnace gases. Supplies of sufficiently pure silica and of fire clay appear to be almost unlimited. Sillimanite brick, tile, and blocks (first introduced in 1921) are used extensively for lining and repairing furnaces, particularly glass furnaces and others in which high resistance to slag is not required. Mullite brick serve an increasingly useful purpose where high refractoriness and resistance to slags and abrasion are required. They are made chiefly of fused mixtures of alumina and fire clay. The great reduction in the amount of magnesite imported (none is available locally in Great

Britain) has led to its replacement by dolomite, which occurs naturally there. The use of dolomite is as old as the basic steel process, but plain calcined dolomite has several serious disadvantages as a refractory material. By combining dolomite with silica, these disadvantages are eliminated. Serious difficulties have occurred in the importation of chrome ore, but this has been taken over by the Control Department of the Ministry of Supply, and a considerable improvement in the quality of the chrome ore supplied to makers of refractories is expected. Aluminum oxide may be regarded as the most heat-resistant of all commercial materials that can be molded into various shapes. It is expensive, but this does not prevent its use in chemical and other industries under conditions which no other substance can so long withstand It is also used in large quantities to increase the refractoriness of fire clays and in the production of mullite refractories. No essentially new refractory materials were reported in 1941. The use of pyrophyllite has been extended, and it is claimed that firebrick made of such material do not shrink in use, withstand working temperatures up to 1690°C. (Seger cone 31), and have a high resistance to spalling. The present circumstances are not favorable for the rapid development of forsterite refractories. As a result of research work and reports on the application of insulating brick to kilns and furnaces, the avoidable loss of heat is much less than it was 10 years ago. No striking improvements in the manufacture or use of insulating brick were published during the past year. There is still room for improvement in resistance to slag, as this would permit the use of insulating brick nearer to the hot face than is now possible in many furnaces. Practical improvements have been made in the construction of humidity and heat controls in driers, resulting in savings of time and fuel, reduction of loss through spoilage, and the doubling or trebling of the output of the drier. The present trend is to dry plain brick in continuous driers; special brick, sleeves, nozzles, etc., in batch driers; and large slabs and blocks on drying floors where they can be inspected frequently. A well-designed humidity drier can dry almost any refractory article other than a large block in 48 hr., but the average time varies from 72 to 144 hr. Relatively few improvements have been made in kilns used for firing refractory materials. The use of tunnel kilns for this purpose is steadily increasing, owing to the labor shortage, notwithstanding their greater cost of construction. Much literature has been published on the causes of defects, particularly in regard to regenerators used in connection with steel and glassmelting furnaces where the selection of suitable brick is of prime importance. Investigations of the causes of corrosion in open-hearth furnaces, crucibles, and cement kilns have also yielded valuable results. The use of a recently developed flat arch in billet-heating furnaces has improved the heat transfer and uniformity of temperature and has effected a saving in fuel. A.B.S.

Refractory linings in zinc carbonate calciners. A. G. Arend. *Chem. Age* [London], **46** [1180] 75–76 (1942).—In a new type of vertical shaft kiln resembling a lime kiln, fired by producer gas, the lining consists of fire-clay brick and blocks, some of which are arranged to form a duct for heating the air used for combustion. Silicates in the zinc ore which affect the lining should be removed before calcining. The lining of the hottest zone is made of readily replaceable blocks. A.B.S.

SEPARATE PUBLICATION

Development of a Refractory Aggregate from Virginia Kyanite. J. P. Sawyer, Jr., and J. W. Whittemore. *Bull. Virginia Polytech. Inst., Eng. Expt. Sta. Series*, No. 49, 37 pp. (Nov., 1941).—The requirements of a satisfactory aggregate (grog) are discussed. The results of tests on a large number of different body compositions are given. A satisfactory aggregate may be manufactured economically from raw Virginia kyanite under the following conditions: (1) The kyanite particles should pass a 200-mesh sieve. (2) Bonding agents such as ball clay, kaolin, or bentonite are required to give ease of forming of the aggregate and strength in the dry and fired states and to assist in the development of other essential properties. (3) Fluxes and mineralizers in small proportions are essential to the development of the requisite properties of a suitable aggregate. (4) The body mixes may be formed into shapes for firing by pressing or by extrusion, deairing of the batch being desirable when extrusion methods are used. (5) The products must be fired to temperatures exceeding that of cone 23 with thorough soaking. The most satisfactory body mix of those studied consisted of 93 kyanite, 5 kaolin, and 2% Virginia apatite or Florida phosphate rock. This batch mix, when fired under commercial conditions in a kiln of silica brick, gave the following properties, which fall within the limits of a satisfactory aggregate: (1) apparent porosity, approximately 6%; (2) P.C.E., 36 to 37; (3) linear shrinkage on reheating, approximately 1.6% when subjected to Schedule C of A.S.T.M. Method of Test C 113-36; (4) sufficient hardness and strength so that the fired shapes could be reduced to a desirable particle-size distribution; and (5) a satisfactory color. See *Bull. Amer. Ceram. Soc.*, **19** [12] 459 (1940) P.S.D.

PATENTS

Bonded refractories. Titanium Alloy Mfg. Co., C. J. Kinzie, and E. Wainer. Brit. 543,021, Feb. 18, 1942 (May 1, 1940).

Cast refractory block. G. S. Fulcher (Corhart Refractories Co.). Can. 403,069, Feb. 17, 1942 (Sept. 21, 1938; in U. S. Sept. 28, 1937). G.M.H.

Furnace wall. Louis H. Hosbein (M. H. Detrick Co.). Can. 402,914, Feb. 17, 1942 (April 20, 1940; in U. S. April 22 and Oct. 18, 1939). Can. 402,915 and 402,916, Feb. 17, 1942 (Aug. 20, 1941). G.M.H.

Furnace wall. A. P. Short. U. S. 2,273,898, Feb. 24, 1942 (Feb. 3, 1940). N. E. Werner (Bigelow-Liptak Corp.). U. S. 2,275,933, March 10, 1942 (Jan. 29, 1940).

Manufacture of heat-cast refractories. R. Haddan (Corning Glass Works). Brit. 542,550, Jan. 28, 1942 (Feb. 13, 1941).

Manufacture of magnesium products from brines. R. E. Clarke (Marine Magnesium Products Corp.). U. S. 2,276,245, March 10, 1942 (Oct. 25, 1938).

Refractory brickwork. W. R. McLain. U. S. 2,275,083, March 3, 1942 (Aug. 10, 1939).

Refractory furnace lining. A. W. Bennis. Can. 402,718, Feb. 10, 1942 (Sept. 10, 1940). G.M.H.

Regenerative coke oven. Carl Otto (Fuel Refining Corp.). U. S. 2,273,886, Feb. 24, 1942 (Jan. 20, 1940; Dec. 9, 1940).

Suspended arch for furnaces. L. L. Ladd. U. S. 2,274,240, Feb. 24, 1942 (Dec. 6, 1940).

Underfired coke oven. Carl Otto (Fuel Refining Corp.). U. S. 2,273,885, Feb. 24, 1942 (Oct. 9, 1939).

Water-cooled baffle and wall. G. W. Davey. U. S. 2,276,025, March 10, 1942 (April 29, 1940).

Terra Cotta

Compounding stoneware tile bodies. B. Bassa. *Keram. Rundschau*, **46** [22] 243–46 (1938).—Stoneware tile are made from special fine clays having a high plasticity. Alkalis and alkaline earths are used to promote sintering, and quartz enables the tile to withstand the severe firing. A body cannot be composed on the basis of calculations alone; an exact knowledge of the chemical and physical properties of the raw materials, changes in properties during production, and their correction is necessary. Stoneware tile bodies usually contain 46 parts by weight clay substance, 30 quartz, 20 feldspar, and 4 flux. The decarbonizing period is critical, and the atmosphere should be kept strongly oxidizing to permit the burning out of organic constituents. Only clays with

very little iron oxide, titanic acid, and other impurities can be used for white tile bodies. For yellow tile, clays containing calcium oxide, titanic acid, and iron oxide are used. Several suitable red clays are available for red tile bodies, and a variety of shades can be obtained. Very finely ground chrome ore (1 to 3%) is added to white bodies to produce gray tile. Cobalt preparations are added for blue tile, the percentage (usually 1%) being determined experimentally. Intense yellow clays are added to blue bodies to produce green tile; other preparations for producing green tile are given. Bodies for black tile usually have the same parent batch formula with finely ground iron pyrites obtained from the manufacture of sulfuric acid or very finely ground pyrolusite as coloring materials. Flaws and discolorations and their prevention, the fluxing action of coloring substances, the correction of color changes on firing, and the prevention of cracks and deformations caused by shrinkage, etc., are discussed. M.V.C.

Rhenish stoneware. HILDE BOLLENBACH. *Keram. Rundschau*, **48** [35] 291–93 (1940).—Rhenish stoneware belongs to the oldest European ceramic ware, and its development reflects the cultural growth of the country. Primitive pieces date from the 14th century and are unglazed, yellow or dusty brown in color, and without ornament except for the turning grooves. The deposits of fine clays and the heavy forests for fuel present in this region contributed to the development of stoneware. Salt glazing was learned early; the first colored glaze was made with cobalt blue, which was best suited to the gray body; later, manganese violet became a characteristic color. Three varieties of ornamentation typical of Rhenish stoneware as it reached its highest development in the 15th and 16th centuries are as follows: (1) "Redmachen" technique, in which the design is cut in the body with a wooden implement and then enameled; (2) Knibis technique, which consists in indenting the surface with a series of bands of shallow grooves, wavy lines, or rosettes, etc.; (3) mounted relief ornament. With the introduction of porcelain and whiteware, highly ornamented stoneware lost in popularity, and mechanization of production flooded the market with cheaper products. Only the simplest articles were then made of stoneware. The old technique of hand ornamentation of stoneware is now taught at the State Ceramic Technical School in Höhr, Germany. M.V.C.

Testing stoneware clay for gray mosaic slabs without the use of chrome ore. GERHARD MÜLLER. *Keram. Rundschau*, **48** [17] 141–42 (1940).—A stoneware clay from the region of Silesia, which turns gray when fired, was used in experiments to obtain a deeper gray coloring of the body without chrome ore, the use of which is now prohibited in Germany. The chemical analysis of the clay is SiO_2 55.36, Al_2O_3 25.90, Fe_2O_3 1.28, MgO 0.21, alkali oxide (mostly Na_2O) 0.12, and SO_4 4.10%; loss on ignition 12.90%. Firing tests showed that a more intense gray is obtained at Seger cone 8 than at cone 10. Certain fluxes deepen the coloring; Ströbel feldspar has a greater effect than Amberger feldspar sand, a maximum being produced by an addition of about 25%. The gray coloring was considerably darkened by the addition of Kellersberger manganese black sand; 2.5% manganese black sand with 65 clay, 22.5 feldspar, and 10% sand gives a clear bluish gray. M.V.C.

Whiteware

Experiments with lead-free and boron-free glazes. ERNST HINRICHS. *Keram. Rundschau*, **48** [23] 189–91 (1940).—A series of 20 frits was produced to study the individual action of BaO, K_2O, CaO, Na_2O, and ZnO; as many combinations of the RO groups as possible were tried. The compositions of the five groups of frits are tabulated, and the frit batches (in 100 parts by weight) are given. The method of testing is described. The fusibility of the frits in comparison with that of Seger cones was established by firing frit cones with Seger cones in saggers, and the fusing points of the cones are tabulated. The results obtained for each group are discussed. The maximum and minimum limits for the additions of the compounds are summarized. With a low Al_2O_3 content of 0.15 and a SiO_2 content of 2.000 to 2.200, the quantities of the other constituents may vary within the following limits: BaO 0.000 to 0.080, K_2O 0.3000 to 0.190, CaO 0.240 to 0.160, Na_2O 0.220 to 0.280, ZnO 0.190 to 0.240, and MgO 0.050 to 0.050. A favorable effect is obtained by adding not more than 0.250 to 0.300 mole Al_2O_3 and 2.600 to 2.900 moles SiO_2. Within these limits, a suitable glaze can be found for specific cases, providing the instructions of Berdel are followed. These are as follows: (1) use quartz and shards of high alkali concentration; (2) keep the lime content as high as the fusibility of the glaze permits; (3) keep the alumina content as high as possible until devitrification ceases; and (4) keep the glaze acid, i.e., high in silicic acid, to prevent cracking and to produce chemical and water stability. Advice on industrial problems is given. Tank furnaces can be used satisfactorily. The batch must be carefully prepared. Settling is avoided by blending a fritted glaze with a raw glaze. An excellent raw glaze and its production are discussed. See "Practical . . .," *Ceram. Abs.*, **20** [9] 220 (1941). M.V.C.

Glaze frits in the tank furnace. ANON. *Keram. Rundschau*, **49** [2] 13–15 (1941).—A discussion is presented on the type of melting furnace for frits for ceramic glazes which might be the most advantageous under the present conditions in Germany; these prohibit the use of lead- and boron-containing compounds which give fairly fluid frits, and the fluidity is now greatly reduced. A comparison of the advantages and disadvantages of tank furnaces with those of rotary furnaces (which gave good results under former conditions) showed that tank furnaces can give good results if necessary changes are made in the melting process with regard to draft, temperature, and sudden temperature changes. A short hot flame should be used; this requires a high H content of the heating gases which can be obtained by placing a water container (on a car) in the ashpit. The water vapor decomposes in the fuel layer, forming hydrogen and, at the same time, cooling the grate. To reduce the attack of molten frit on the furnace lining, a special "bed" of a rammed mixture of a character adapted to the frit should be made on the bricked-up hearth; acid mixtures have proved to be satisfactory. The frit should be introduced in small charges to insure a well-mixed molten frit; it is advisable to briquette the batch and moisten it before charging. As the loose batch contains a great deal of air, the heat penetration is slower and degassing is delayed; these difficulties are minimized by briquetting. The lower Pb and B content of the present frits makes them more sensitive to S action; this can be avoided by a weakly reducing firing. A semiautomatic half-gas firing seems to give good results, especially with producer gas. The new frits contain K and Na as the principal fluxes; these behave differently in the absence of Pb and B. They should therefore be introduced in the form of water glass in small pieces, and the quartz content of the batch must be adjusted to the composition of the K or Na water glass. M.H.

Gold or porcelain teeth? LAKAFF. *Keram. Rundschau*, **48** [23] 192–93 (1940).—Dentistry has consumed about 4000 kgm. gold in the last few years; because of the metal shortage in Germany, however, it is now being replaced more and more by porcelain. In early times, false teeth were made of ivory or the teeth of animals or corpses. In 1730 the apothecary Duchateau became dissatisfied with the color and taste of his ivory set and conceived the idea of porcelain teeth. In 1800 an Italian, Fonzi, made considerable improvements in false teeth. During the 19th century America became the leading producer of false teeth, and the first factories were

built there. After World War I, Germany became a competitor in this field. The term "porcelain" teeth is inaccurate because of the difference between porcelain bodies and the bodies used in the manufacture of false teeth. The latter have a high feldspar content and only enough kaolin to opacify them: kaolin 5 parts, quartz 35, and feldspar 55 to 65 (the exact composition is a trade secret). For fillings, a prefused glass frit is often used. The mixture is prepared by grinding pure feldspar to the correct fineness and then grinding again with additions of kaolin, quartz, and coloring materials such as titanium oxide for light yellow, uranium oxide for brownish or gray, and cobalt oxide for light-blue tones. The mixture is pugged and pressed in matrices, preheated to 200°C., worked, and prefired for 30 min. at 900°C. Deformations caused by shrinkage are corrected, and the mass is fired again to 1200° to 1300° for 15 min. A third or fourth firing may be necessary to obtain the exact form. A gradual temperature increase is important. The three-color tooth (neck body, center body, cutting edge body) has shown definite progress. The firing of an opaque hard porcelain layer on metal and coating with a tinted porcelain body is a later innovation. M.V.C.

Progress of pottery in England. ANON. *Times Trade & Eng.*, **50** [934] 38 (1942).—When the plans of the Board of Trade for the concentration of the pottery industry are in full operation, many firms will have ceased production for the duration of the war. These firms are, in the meantime, disposing of existing stocks. Nucleus status has been granted primarily to firms whose chief trade is overseas. The demands of the U. S. and Canada are keeping them fully occupied. For the home market, patterns are being limited to stock lines of tableware and similar domestic goods, fancy lines being mainly for the export trade. Many firms have been inundated with orders for tableware, and the Board of Trade made undecorated domestic earthenware and china free of quota from Dec. 1 to May 31. The greatest demand has been for cups and saucers, and, because of the Limitation of Supplies Order, it has been impossible in many instances to meet the demands of caterers, canteens, and refreshment rooms. The labor problem is now very acute in the Staffordshire potteries and has been engaging the attention of the National Council of the Pottery Industry. A.B.S.

Properties of ceramic materials. HANS THURNAUER. *Electronics*, **12** [3] 33 (1939); *Chem. Abs.*, **33**, 8371 (1939).—T. tabulates the mechanical and electrical properties of porcelain, commercial and low-loss steatite, cordierite, TiO_2, and lava materials compiled from average values listed by manufacturers and standard references. See "Ceramic insulating . . . ," *Ceram. Abs.*, **21** [3] 63 (1942).

PATENTS

Electric insulator. J. J. TAYLOR (Ohio Brass Co.). U. S. 2,275,208, March 3, 1942 (July 11, 1940).

Expansion chamber for bushing insulators. T. F. BRANDT AND H. L. BROUSE (Ohio Brass Co.). U. S. 2,275,215, March 3, 1942 (March 15, 1939).

Fitting for post insulators. J. J. TAYLOR (Ohio Brass Co.). U. S. 2,275,207, March 3, 1942 (May 3, 1940).

High-tension electric insulator and method of attaching a metal fitting thereto. L. J. DYKSTRA AND E. M. MEYER (Victor Insulators, Inc.). U. S. 2,274,954, March 3, 1942 (Sept. 17, 1940).

High-tension electric insulator and method of coating. L. J. DYKSTRA AND E. M. MEYER (Victor Insulators, Inc.). U. S. 2,274,955, March 3, 1942 (Sept. 17, 1940).

Making ceramic articles. R. E. GOULD. U. S. 2,273,859, Feb. 24, 1942 (Oct. 31, 1938).—The process of making a ceramic article from plastic clay which comprises simultaneously forming one side of a ceramic article from plastic clay on a thin fluid-pervious mold of uniform thickness and forming the other side of the plastic article by pressing and shearing the plastic clay, applying a subatmospheric pressure to the bottom of the fluid-pervious mold during the forming of the article to maintain a uniform differential pressure between the top and bottom of the plastic clay as the article is molded, placing the face of a cast, preformed to be complementary to the top of the molded article, on the molded article, separating the cast and the molded article from the mold, drying the molded article, separating the dried molded article from the cast, and firing the dried molded article to produce a semivitrified ceramic article.

Making spark plugs. HECTOR RABEZZANA (General Motors Corp.). U. S. 2,273,990, Feb. 24, 1942 (Feb. 24, 1941).

Method and apparatus for manufacturing pottery ware. W. J. MILLER. U. S. 2,274,426, Feb. 24, 1942 (Aug. 9, 1937).

Rotary ceramic trimming condenser. STANDARD TELEPHONES & CABLES, LTD., W. SELLORS, AND G. W. SEARLE. Brit. 543,225, Feb. 25, 1942 (Aug. 13, 1940).

Spark plug. BERNARD HOPPS (Baker & Co., Inc.). Can. 402,751, Feb. 10, 1942 (Jan. 18, 1940). G.M.H.

Spark-plug insulator. J. A. JEFFERY (Champion Spark Plug Co.). U. S. 2,274,067, Feb. 24, 1942 (May 27, 1938).—A fine-grained, dense, ceramic insulating material consisting of upward of 90% sintered alumina, 0.7 to 1.40% CaO, and $\frac{1}{3}$ to $1\frac{1}{3}$ times as much MgO as there is CaO, any remainder consisting chiefly of silica.

Equipment and Apparatus

Approximate viscosity equivalents at the same temperature. ANON. *Can. Machinery's Data Sheet*, No. 27; *Can. Machinery*, **52** [5] 57 (1941).—Saybolt Universal, Redwood No. 1, Engler, Kinematic, Barbey, Saybolt Furol, and Redwood No. 2 equivalents are given. E.D.M.

Assessment of metallic plain bearing material in the light of recent literature. R. KÜHNEL. *Z. Ver. Deut. Ing.*, **85**, 201–206 (March 1, 1941); *Science Abs.–B*, **44** [528] 232 (1941).—K. presents a survey of recent technical literature concerning the materials for and the design of plain bearings. The effective fixing of the lining in the journal, the lining surface, special methods of casting (centrifugal and die-casting), mechanical properties and design, testing machines, friction coefficients, and the effects of temperature are dealt with. The questions arising from the replacement of scarce materials by home-produced substitutes are also discussed. 41 references. H.K.R.

Determination of particle-size distribution for particle sizes between 40 and 1 or 2 microns. W. O. HINKLEY. *Ind. Eng. Chem., Anal. Ed.*, **14** [1] 10–13 (1942).—Various sedimentation methods are discussed, and the technique of one is described in detail. Illustrated. F.G.H.

Dispersion of pigments by ball and pebble mills. EARL K. FISCHER. *Ind. Eng. Chem.*, **33** [12] 1465–71 (1941).—Optimum conditions for the operation of steel ball mills for pigment dispersion have been investigated experimentally in mills ranging from laboratory to production sizes. Microscopic examination of the dispersions and the rate of strength development were used as the criteria for evaluations. The dispersion rates were correlated with ball size, relative volume of ball and mix charges, and mill diameter. The charge ratios usually recommended depart considerably from optimum milling conditions. By adjustment of the formulation to allow proper cascading of the balls and by maintaining the charge only slightly in excess of the voids in the ball mass, milling times can be shortened. Operating in this way, laboratory mills provide a close indication of the results obtainable with production-size mills. Illustrated. F.G.H.

Electrical precipitation. ANON. *Elec. Rev.*, **129**, 253–59 (Sept. 19, 1941); *Science Abs.–B*, **44** [528] 235 (1941).—The applications of mechanical and electrical precipi-

tators are discussed. The electrical precipitator is much more efficient, the chief disadvantage being the high cost, particularly of the smaller sizes. This may be overcome in some cases by the use of a thermionic valve rectifier in place of the usual rotary rectifier, though in general the latter is preferred because of its simplicity. Horizontal and vertical apparatus are compared. Brief mention is made of recent developments such as thermal precipitation, in which the corona effect is produced by the electric field associated with a high-temperature conductor, and the precipitation of impurities from liquids. H.K.R.

Finding the expansion of metal with temperature. ANON. *Can. Machinery's Data Sheet*, No. 26; *Can. Machinery*, **52** [4] 49 (1941).—A nomogram for the calculation of the expansion of any metal from mild steel to bronze, i.e., any material having a coefficient of expansion between 0.000005 and 0.000012, is presented. It handles any length from 20 ft. to 10,000 ft. E.D.M.

Industrial water treatment, 1918–1938. SHEPPARD T. POWELL. *Chem. Industries*, **44** [3] 266–72 (1939).—An extensive review of the development of water-treatment processes during the past 20 years is presented. Coagulation, filtration, and softening by chemicals, zeolites, and other ion-exchanging materials are discussed. By the use of suitable exchangers, ions such as Ca, Mg, etc., may be replaced by hydrogen and hydroxyl ions, and the complete elimination of both positive and negative ions can be effected. Complex organic resins such as phenolic plastics are now used as ion exchangers. Sodium phosphate or carbonate is used for the prevention of scale in boiler feed water. The hot process using phosphate produces a boiler feed water whose hardness is too low to be detected by routine tests. Corrosion is controlled by the proper adjustment of the pH of the water. Dissolved oxygen is also corrosive and may be largely removed by heating or completely removed by atomizing the water in a vacuum. It is also removed by the addition of reducing agents such as sulfite. Boilers may be given a protective coating which is heat conducting and resistant to corrosion. For mildly corrosive waters, nonferrous metals are satisfactory; for severe cases, cement or rubber-lined pipes are necessary. E.D.M.

Lubricating oils for molds and dies. ANON. *Sprechsaal*, **74** [6] 49 (1941).—Lubrication is necessary to reduce resistance and abrasion and to prevent adhesion of the body to the dies. Water, emulsions, mineral oil, and mineral-oil mixtures are used. Watery mixtures are inadequate for use in extrusion presses for thin-walled pipe and tile and in molding presses for grooved and ornamented tile. In such cases, watery lubricants promote the formation of furrows in extruded objects and the washing away of decorations on molded objects. Lubricating oils are therefore preferable. The viscosity of the oil to be used depends upon the pressure. An Engler viscosity of 2.5 to 3.0 at 20°C. is high enough for use with relatively low pressures. Engler viscosities up to 3.5 at 20°C. may be used with high pressures. The oils are sometimes compounded with animal or vegetable oils to improve their lubricating ability, but these additions coke easily and may cause the product to stick to the support during drying. Oils of a color depending upon the color of the product must be selected; they should be used sparingly for technical reasons as well as for the sake of economy. W.H.H.

New type screen. ANON. *Chem. & Met. Eng.*, **48** [12] 99 (1941).—A new type of screen (Roto-Flow) operating without screen cloth is capable of screening wet material and has a greater capacity than conventional screens of the same size. B.C.R.

Portable million-volt X-ray outfit for industrial laboratories. E. E. CHARLTON AND W. F. WESTENDORP. *Gen. Elec. Rev.*, **44** [12] 654–61 (1941).—A million-volt portable X-ray outfit is described. It is the result of further development of the features embodied in the million-volt therapeutic X-ray machine built by the General Electric Research Laboratories a few years ago. The new unit can be easily moved in all directions, making it a flexible and powerful tool for the rapid radiographic examination of castings and metal structures which vary greatly in size and wall thickness. L.E.T.

Radiant heat—full-fledged industrial tool. P. H. GOODELL. *Elec. Eng.*, **60** [1] 3–8 (1941).—Most industrial heating processes relying on heat transfer by convection have intrinsic losses in speed of transfer and efficiency. Infrared heating differs from other methods in that the energy is delivered directly from the source to the intended work in radiant form. The greater the density of the heat applied, the faster and the more efficiently transfer of heat occurs. Incandescent lamps have many advantages as sources of radiant heat, e.g., efficiency, cleanliness, long life, and instantaneous response. The wave lengths radiated may be controlled by adjusting the temperature of the filaments so that the absorption characteristics of various materials may be met. G. discusses the blackening and failure of such sources. Radiant heating is applied primarily where low temperatures are needed, up to 600°F. Problems such as uniformity of heat distribution and heat density become very serious in cases where one oven is required to handle many shapes and sizes. The advantages claimed for radiant heating include (1) elimination of the warm-up time by an instantaneous source of heat, (2) prevention of fumes from fuels, and (3) better working conditions as the air is not heated as high as with customary convection ovens. R.L.G.

Recording spectrophotometer and spectropolarimeter. W. R. BRODE AND C. H. JONES. *Jour. Optical Soc. Amer.*, **31**, 743–49 (1941).—The instrument is designed and constructed to meet the needs of the color chemist and the researcher into the relation between optical properties and chemical structure. It plots the light-frequency dependence of the extinction coefficient and the optical rotation. The advantages include speed, removal of personal observational error, and a wide spectral range (from 375 to 1000 mμ). A.P.

Settling and thickening of aqueous suspensions. KARL KAMMERMEYER. *Ind. Eng. Chem.*, **33** [12] 1484–91 (1941).—The settling behavior, with and without stirring, of aqueous suspensions of calcium carbonate, barium sulfate, and silica was studied. The factors influencing the ultimate settling height or the sedimentation volume are, primarily, the initial weight concentration of the suspension and the type of settling, i.e., quiescent or thickening. The relation between the ratio H_u/H_o (ultimate and initial settling height, respectively) and the initial weight concentration, C_o, of suspensions can be expressed by the equation $H_u/H_o = \alpha C_o^n$, where α and n are related to particle size and compressibility, respectively. In the case of thickening, more than one equation may be needed to express the behavior; above a certain bulk concentration, a decrease in packing may occur which is believed to be due to the incidence of thixotropy. Batch settling experiments with slow stirring can be considered as thickening with infinitely slow feed and underflow and should serve as a performance standard of thickening equipment in regard to maximum attainable underflow concentrations. The degree of packing in settling, with and without stirring, can be measured by a thickening ratio. The effect of various experimental conditions was ascertained, and recommendations based on the findings are made. Illustrated. F.G.H.

Verein Deutscher Ingenieure lecture courses on substitute materials in machines and apparatus. G. EHLERS. *Z. Ver. Deut. Ing.*, **85**, 413–15 (May 3, 1941); *Science Abs.-B*, **44** [528] 234 (1941).—In connection with a traveling exhibition of examples of the saving of materials and the use of substitutes, lecture courses were given to an aggregate audience of about 12,000 engineers in 18 towns in order to impress upon them the urgency of the subject. The importance of using materials not of inferior but of equal or even better quality than the traditional substances was stressed. Numerous examples are given. 67 references. H.K.R.

SEPARATE PUBLICATION

Construction of Electric Furnaces for the Laboratory. Norton Co., Worcester, Mass. 22 pp., 25 illustrations.—

This booklet has been prepared as an aid in the design and construction of small laboratory furnaces suitable for relatively high temperatures and in the proper selection of refractory shapes and their advantageous use. Detailed methods and design data are presented. All of the furnace assemblies described have been actually built and tested under laboratory service conditions. Standard types of laboratory furnaces and their uses, refractories, and refractory cements are discussed.

PATENTS

Drier control. J. F. COBB (Moore Dry Kiln Co. of Oregon). U. S. 2,275,042, March 3, 1942 (May 8, 1937).—In a wet bulb thermostatic control for a kiln, a wet bulb in the kiln, a spring tube that is operatively connected to the bulb and is responsive thereto, an actuator attached to the spring tube, two independent control devices that are operable by the actuator by movement of the spring tube at spaced temperature intervals upon rise or fall of the wet-bulb temperature in the kiln, ventilating means and humidifying means for the kiln, and two motors that are operable respectively by the control devices at different temperatures, one motor for operating the ventilating means and one motor for operating the humidifying means.

Extreme-pressure lubricant. S. E. JOLLY AND J. H. PERRINE (Sun Oil Co.). U. S. 2,276,492, March 17, 1942 (Feb. 16, 1940).—An extreme-pressure lubricant comprising lubricating oil containing a minor percentage of amyl benzene dichlor phosphine.

Feeding apparatus. E. V. FRANCIS (Traylor Vibrator Co.). U. S. 2,276,382, March 17, 1942 (March 10, 1938).—A conveyer apparatus for free-flowing pulverulent material comprising the combination with an electromagnetic vibratory feeder of a feed hopper therefor, a storage hopper, motor-driven means for segregating and feeding batches of such material from the storage hopper to the feed hopper, and means responsive to the amount of such material in the feed hopper for controlling the motor-driven means to maintain the head of material in the feed hopper below the value at which it flows freely.

Gypsum mixer. O. M. KNODE, J. A. BESAL, AND F. M. THORMAN (Canadian Gypsum Co., Ltd.). Can. 402,629, Feb. 3, 1942 (June 19, 1940). G.M.H.

Material measuring and dispensing machine. R. L. GOODIN. U. S. 2,275,140, March 3, 1942 (Sept. 4, 1940).

Skirted blower. C. A. BAKER, R. L. HAMILTON, AND S. M. DOCKERTY (Fiberglas Canada, Ltd.). Can. 402,516, Jan. 27, 1942 (May 22, 1939; in U. S. May 24, 1938). G.M.H.

Kilns, Furnaces, Fuels, and Combustion

Chemists and furnace (kiln) operation. ANON. *Chem. Age* [London], **46** [1177] 40 (1942).—Many firms are wasting fuel by not employing chemists to test the gases evolved by furnaces and kilns; chemists should advise and criticize but should not operate the kilns. A.B.S.

Determination of sulfur. WILLIAM RIEMAN, III, AND GEORGE HAGEN. *Ind. Eng. Chem., Anal. Ed.*, **14** [2] 150–51 (1942).—The accuracy and precision of several methods for the gravimetric determination of sulfur as barium sulfate are discussed. F.G.H.

Electric firing in the ceramic industry. E. MAZUREK. *Keram. Rundschau*, **49** [11] 107–11 (1941).—M. discusses and describes batch and continuous furnaces for ceramic purposes. Because of the high cost of electric energy, electric furnaces are used mainly for firing fine ceramic products and for the mass production of vitreous china, sanitary ware, tile, and fire-clay products. M.H.

Measuring instruments for determining the humidity of coals. ANON. *Wärme*, **64** [5] 47 (1941).—A knowledge of the moisture content of coal is desirable not only from the standpoint of economy in the combustion process but also from that of the character of the combustion gases. The usual determination methods are based on drying a sample in a small laboratory furnace and then weighing it on a separate balance. A more convenient instrument is described; it consists of a small (electric or fuel-fired) furnace which forms part of a balance, so that drying and weighing can be done without intermediate handling of the sample and with greater accuracy. M.H.

Stratification of gases in kilns and driers. EDWARD LEDOUX. *Chem. & Met. Eng.*, **48** [10] 83–85 (1941); **49** [1] 92–95 (1942).—L. discusses the mechanism of stratification in a drier. The stratification of gases caused by the continuous or periodic admission of cold air can be avoided by the use of forced draft alone. When both forced and natural draft are used, stratification can be limited through close setting of the ware, airtight door construction, and a loading schedule designed to reduce door openings to a minimum. B.C.R.

Study of the electrical conductivity of agglomerated substances. A. ALISSOFF. *Rev. Gén. Électricité*, **49** [2] 69–90 (1941).—The electrical conductivity of agglomerated substances, e.g., heating elements with a carbon base mixed with silicon carbide, was investigated with regard to their changes with time and as a function of the composition; the samples consisted of small rods of graphite-silicon carbide. The experiments, which are described in full, show that, when current passes through agglomerated substances, they are subject to the action of two effects which tend to modify the conductivity in opposite directions. The first is called stabilization and reduces conductivity with time; this can be expressed by $c = c\zeta_m\left[1 - \left(\frac{1}{\zeta} - 1\right)e^{-\alpha t}\right]$, where ζ and α are numerical coefficients depending on the amount of graphite in the mixture; with 1 to 5% graphite, ζ varies from 0.64 to 0.85 and α from 0.05 to 0.085. The higher the percentage of graphite, the smaller is the effect of stabilization; this means that, for heating elements without appreciable stabilization, a large amount of graphite should be used, and if the resistance is of fairly constant value, i.e., strong stabilization, the least possible amount of graphite should be employed. In general, if the amount of graphite exceeds 5%, the stabilizing effect is very small. The second effect is the increase of conductivity with the current density; this effect becomes more complicated by the heating of the body under prolonged action of the current. If this effect can be eliminated or largely diminished, the conductivity can be expressed by $c = d^a/K$, where a and K are numerical constants depending on the percentage of graphite; curves are given for these values for different graphite mixtures with refractory materials. For application to practical cases, three formulas derived from the above equations give the heat required, the voltage available, and the length and diameter necessary for the heating element. M.H.

Underground annular kiln for firing bisque ware. JOSEF GREWE. *Keram. Rundschau*, **48** [19] 157–60 (1940).—The underground annular kiln used in the production of heavy ceramic ware is cheaper to build than the annular kiln and, when properly constructed and improved, can be adapted to firing bisque ware. G. gives a detailed description of the construction with diagrams showing the cross section of an ordinary underground annular kiln and the improved gas-fired type, the ground plan of an improved gas-fired chamber annular kiln, the layout of the gas conduits, the longitudinal section of the entire furnace, etc. M.V.C.

Volumetric determination of sulfur in coal and coke. S. S. TOMKINS. *Ind. Eng. Chem., Anal. Ed.*, **14** [2] 141–45 (1942).—The present accepted standard method for the determination of sulfur in coal and coke specifies its oxidation and the recovery of the sulfur compounds in the form of soluble sulfates, followed by gravimetric determination as barium sulfate; this is accomplished by combustion of the coal in an oxygen bomb, ignition with Eschka mixture, or fusion with sodium peroxide. The soluble sulfates are recovered in the bomb washings or by

leaching the Eschka and peroxide residues. Complete conversion of the sulfur compounds to sulfate is ensured by a further wet oxidation with bromine water. Some fuel laboratories have found the gravimetric determination as barium sulfate time-consuming and costly, especially where a large number of coal samples are tested daily, and have studied volumetric methods using internal indicators. The methods receiving the most consideration employ either tetrahydroxyquinone or sodium rhodizonate as indicator. The A.S.T.M. Committee D5 on Coal and Coke has sponsored a cooperative study of the comparative accuracy and reproducibility of the standard method of sulfur determination and of volumetric methods using tetrahydroxyquinone and sodium rhodizonate as indicators. Results indicate that the volumetric methods using either tetrahydroxyquinone or sodium rhodizonate as indicators will yield results of the same degree of reproducibility and accuracy as those of the present standard gravimetric method. The procedures involved in both volumetric methods are described in detail. F.G.H.

PATENT

Pyrometric cone plaque. H. S. Orth, C. R. Oberst, and W. E. Cramer (Industrial Ceramic Products, Inc.). U. S. 2,274,343, Feb. 24, 1942 (April 3, 1940).

Geology

Bintan's bauxite. Anon. *Times Trade & Eng.*, **50** [933] 32 (1942).—Bauxite was first mined in the Dutch East Indies in 1935 when 10,000 tons were mined. The output has grown rapidly and is now 200,000 tons a year (6% of the world production). Japan's aluminum industry is largely dependent upon the Netherlands East Indies ore, as Manchurian shale and Korean alunite have proved to be unsatisfactory. The main deposits are found on the island of Bintan (opposite Singapore) and in the adjacent islets. Estimates of the ore reserves vary from 10 to 20 million tons (1 to 2% of the world reserves), which are sufficient to maintain output at its present level for several decades. The development is in the hands of the Netherlands Indian Bauxite Exploitation Co. The chief workings are near the Kidjang Strait, southeast of Bintan, and heavy-draught freighters can moor directly alongside the quays at the loading depots. A.B.S.

Concentration of magnesitic dolomite from Kilmar, Quebec. Anon. *Can. Mining Jour.*, **63** [3] 157–65 (1942).—Tests on carlot quantities of Kilmar dolomite show that flotation is suitable for the production of a magnesite product low in lime. Magnesite recoveries of 50 to 60% can be obtained, giving a concentrate of 25 to 32% of the mill feed by weight from a rock containing 13% lime. The content of lime in the concentrate will depend on the extent of interpenetration and the amount of inclusions of dolomite in the magnesite. If these were both small, the concentrate would contain about 2% lime; if high, the lime content might be as high as 4.5%. Fine grinding is necessary. The temperature of the flotation-circuit pulp should be around 70°F. G.M.H.

Constitution of kaolin and its behavior at high temperatures. F. W. Meier. *Sprechsaal*, **73** [5] 35–37; [6] 43–44; [7] 51–53 (1940).—The study of the system Al_2O_3–SiO_2 is one of the most important problems of silicate chemistry. The aqueous aluminum silicate $Al_2O_3 \cdot 2SiO_2 \cdot 2H_2O$ is the main ingredient of kaolin and clay and gives them their characteristic properties. In evaluating ceramic raw materials, an exact knowledge of the constitution and the properties is necessary. Suitable methods must be developed to study them, as the rational analysis of the composition of clays and kaolins is no longer sufficient. Microscopic and X-ray research have made important contributions but do not yield usable quantitative data. The reactions taking place during dehydration, thermal phenomena occurring at high temperatures, and the solubility of kaolin components in dependence on the firing temperature are studied. Exhaustive investigations of the properties of the clay substance were made on pure Zettlitz kaolin and on elutriated Zettlitz kaolin. M.V.C.

Germany's wartime bauxite supplies. Anon. *Chem. Age* [London], **45** [1171] 290 (1941).—Germany is the largest consumer of bauxite. It manufactures aluminum from imported ores exclusively. Domestic deposits of bauxite are not extensive and supply a poor grade of ore; even after artificial concentration in the smelting process, it is costly, but it is used in the production of artificial corundum, aluminum salts, and refractories for the iron industry. Hungary is one of the most important sources of bauxite, its resources being 250 million tons greater than those of any other country. The most important deposits, at Gant near Mór in the Vertes Mountains, are relatively high-grade despite the fact that their composition varies considerably. Bauxite worked in the last few years contained from 50 to 63 Al_2O_3, 2 to 4 SiO_2, 15 to 30 Fe_2O_3, $2^1/_2$ to 4 TiO_2, and 16 to 20% moisture. The second largest region lies in the forest of Bakony near Halimba, between Tapolcza and Sumey. The deposits are not being worked at present. The bauxite is low-grade, and open-pit mining is not feasible because of the heavy overburden. A high-grade bauxite (65% Al_2O_3) deposit lies in southern Hungary near the border of Yugoslavia. This deposit, however, is not extensive. The ore has to be mined by underground methods, and an output of 5000 tons annually has been planned. The reserves of the district are reported to be 200,000 tons. Near Perepuszta a similar deposit is being mined to a small extent by open-pit methods. In 1938, Hungary mined 521,400 tons of bauxite and ranked second in world production. For a number of years, several thousand tons of Hungarian bauxite were consumed by the domestic aluminum industry, and the rest was exported to Germany. Yugoslavia also has extensive bauxite deposits, partly high-grade. Mining is carried on in a relatively small area: in Herzegovina, mainly at Siroki-Brijeg west of Mostar (53 to 60% Al_2O_3), and in two regions of Dalmatia, at Sinj in Spalato and Drnis in Šibenik (52 to 63% Al_2O_3). In the interior of Dalmatia, near Imotski, are large and little-known deposits which have not yet been worked and which extend to the north and to the east as far as Bosnia. High-grade deposits are present in Montenegro, between the coast and Lake Skutari, near Bar and Ulcinj, and in the interior west of Nikšić, but they cannot be worked owing to inadequate transport facilities. Deposits in the Drnis and Sinj regions are covered more deeply and have to be worked by underground methods. In 1938, Yugoslavia produced 405,000 tons of bauxite and ranked third in the world production. Most of the output is exported to Germany by water. The domestic needs of Yugoslavia will never be large, but the favorable location and the quality of the ores assure Yugoslavian bauxite a good outlet in all bauxite-importing countries. Rumania's bauxite deposits lie in the Bihor mountains west of Klausenburg in Transylvania. Reserves are estimated at 2 to 10 million tons, but generally speaking, the ore is not as high-grade as that of Hungary and is not valued as highly as the Hungarian by German consumers. An output of 12,000 tons (0.3% of the world production) was reported for 1938. A.B.S.

Increasing the degree of dispersion of molding clays. I. S. Grigor'ev. *Liteĭnoe Delo*, **9** [8–9] 13–23 (1938); *Chem. Zentr.*, **1939, II,** 508; *Chem. Abs.*, **35,** 3403 (1941).—Natural clays are made up of electrically neutral gels which can be converted by electrolytes into highly disperse, negatively charged systems. The more absorbed Ca and Mg they contain, the more readily the change takes place. Although the combined alkaline earths do not react, the absorbed divalent ions can be replaced by univalent ions, especially by NH_4 or K (with difficulty by Li). Ca is 8 times more easily replaced than Mg. The exchange process is dependent upon the amount and con-

centration of the electrolytes, the ratio between electrolyte and clay, the number of operations to which the material is subjected, and the type of electrolyte and of clay, but it is not dependent upon the temperature or the duration of treatment. With low electrolyte concentrations (0.1 to 0.5 *N*) stable gels are obtained with only 3 or 4 operations. The viscosity or toughness of the gel (but not its stability) is dependent upon the concentration and the number of operations to which it has been subjected. Highly disperse clays impart great strength to the molding batch (increasing it 100 to 500%), make longer periods of use possible, and can replace high-grade bentonites.

Origin and classification of quartzites. F. BONTE. *Keram. Rundschau*, **49** [1] 3–5 (1941).—Quartzites generally originated through the disintegration of eruptive rocks due to atmospheric influences and the subsequent action of flowing water; deposits of more or less pure SiO_2 were produced. There are four types of quartzites: (1) Crystalline quartz. This is a product of sedimentary coarse quartzite containing amorphous SiO_2 in pores. It is found near Bunzlau (Silesia) and is grayish white and white after firing. (2) Crystalline quartzite. The quartz grains are strongly corroded. It is very hard because of intimately "geared" (grown into one another) particles; it is not brittle and is white. The clay content is low. The quartz grains are partly enveloped by a layer of SiO_2. (3) Quartzite with granular quartz cement. This originated from a loose sediment with coarse and fine quartz grains. Recrystallization of the gel-like precipitated SiO_2 created new crystalline grains which are called "granular cement." It is yellowish white and is comparatively soft. It is formed in large lumps near Aschitzau. (4) Quartzite with amorphous basalt cement. This originated from sediments from the kaolinization of porphyry and contains, in addition to large quartz pieces, very fine-grained quartz dust and some clay substance. The corrosion of the smallest particles produces, by later precipitation and hardening of the SiO_2, an alumina-containing amorphous basalt cement. This type is found at Hermannsdorf near Bunzlau; it is very brittle and is yellowish gray. The properties of the four groups are described. Illustrated. M.H.

Products from diatoms. PAUL D. V. MANNING. *Chem. & Met. Eng.*, **48** [9] 114–15 (1941). B.C.R.

Phenomena which occur when a kaolin is gradually heated in the presence of air and other gases. GUSTAV F. HÜTTIG AND ERICH HERRMANN. *Kolloid-Z.*, **92** [1] 9–35 (1940).—This report is based on the experiments of others. Tables show the results of sorption tests on one type of kaolin. In each table, for a given sorption medium and atmosphere, each column shows variations in gas adsorbed (in millimols per gm. = *n*) when *p* (the adsorption pressure) varies from 1 to 70 mm. Each line of the table shows variations in adsorption, for a given adsorption pressure, as the preheating temperature varies from 20° to 700°C. Each column thus gives an adsorption isotherm for a given preparation. Values of *n* were obtained by interpolation on a large *p-n* diagram. Results of X-ray tests and tests with methylene blue are shown diagrammatically. The decrease in the water content of the kaolin with rise in calcining temperature is discussed. See "Increase . . .," *Ceram. Abs.*, **20** [11] 263 (1941). W.H.H.

Romance of American potash. HORACE M. ALBRIGHT. *Chem. Industries*, **44** [2] 150–53 (1939).—Potash was first produced commercially in the U. S. from the Searles Lake deposits in California and later from deposits in New Mexico. These deposits are all soluble potassium salts. A list of potassium salts and their uses is given. See *Ceram. Abs.*, **17** [10] 340 (1938). E.D.M.

Study of the fine structure of clays by means of the electron microscope. JOACHIM ENDELL. *Keram. Rundschau*, **49** [3] 23–26 (1941).—The principle and the construction of the electron microscope are explained. By its use, clay minerals can be more clearly differentiated. While the ordinary light microscope permits the recognition of crystals as small as 0.2μ and the ultramicroscope, crystals as small as 0.1μ, the electron microscope makes visible particles of only 3 to 5 mμ. Kaolinite crystals are distinguished by the sharpness of their crystal edges and their thickness (about 20 mμ). The electron microscope shows the change in the size and surface of the crystals after heating to 1200°C. Montmorillonite crystals have a more ragged appearance and cleave to a thickness of up to 1 mμ, i.e., the thickness of an elementary layer. This accounts for the fact that the plastic behavior of montmorillonite in ceramics is superior to that of kaolinite. The exceptional fineness of the montmorillonite particles explains the low permeability to water of montmorillonite-sand mixtures in comparison with kaolinite-sand mixtures. The low water permeability of bentonite makes it suitable for caulking street joints and prevents damage from frost. Mixtures of German bentonite and sand have a greater green strength than mixtures with American bentonite. The less sharply formed particles of German Na bentonite cause it to swell more rapidly in water than American bentonite. A bentonite with well-formed lamellas is better adapted to the manufacture of films than that with less sharply defined and more lobated lamellas. Electron exposures of clay suspensions are given; a suitable suspension for observation in the electron microscope comprises 1 part clay to 10,000 to 1,000,000 parts of water, peptized with 0.01 *N* NH_4OH. The suspension is fixed on a glass slide with a film of collodion 10 mμ thick. Fifteen references. M.H.

BOOK

Indian Clays. M. L. MISRA. Published by Vighyan Parisad, Allahabad. 300 pp. Price Rs. 1/8. Reviewed in *Trans. Indian Ceram. Soc.*, **1** [1] 29 (1941).—This book is the first of its kind in any of the Indian languages and is a definite step in the growth of technical literature in Hindi. The subject is treated from a geological standpoint. The origin, prospecting, winning, washing, mineralogical aspect, and microscopic examination of the clays are discussed. The distribution of pottery clays in India and their occurrence, physical properties, and chemical analyses are systematically given. The possibilities of development and means of transportation are dealt with. The book will be of value to all those interested in ceramics.

Chemistry and Physics

Apparatus for iodometric determination of tin. W. M. RUMBERGER. *Chemist-Analyst*, **31** [1] 16 (1942).—A 500-ml. three-necked flask facilitates the introduction of KI and starch indicator and the maintenance of a CO_2 atmosphere. A.P.

Calcium metaphosphate. Rate of reaction of phosphorus pentoxide with rock phosphate. G. L. FREAR AND L. H. HULL. *Ind. Eng. Chem.*, **33** [12] 1560–66 (1941).—Illustrated. F.G.H.

Colorimetric determination of phosphorus in soils. Provision for eliminating the interference of arsenic. MILDRED S. SHERMAN. *Ind. Eng. Chem., Anal. Ed.*, **14** [2] 182–85 (1942).—A rapid and accurate colorimetric method has been developed for the determination of phosphorus in soils. The soil is digested with 60% perchloric acid which quickly destroys the organic matter and converts the phosphorus present to the inorganic form. A final boiling temperature of 203°C. is probably responsible for the complete extraction of the soil phosphorus. An aliquot of the perchloric acid solution of the soil is treated with ammonium molybdate and 1,2,4-aminonaphtholsulfonic acid. The depth of the blue color formed is measured with a photoelectric colorimeter, and the phosphorus value is calculated from the calibration curve of the instrument. The values for the determination of phosphorus in thirteen soil samples of varying iron and organic matter content are presented; they are shown to be in close accord with those obtained by the conventional gravimetric method of

W. O. Robinson. The working time for six determinations is 3 hr. F.G.H.

Electrolytic iron as a standard for the colorimetric determination of iron. J. E. Lindsay. *Chemist-Analyst*, **31** [1] 8–9 (1942).—Owing to its very high purity, electrolytic iron is recommended for analytical methods. The procedure for the thiocyanate method for the analysis of glass sand is detailed. A.P.

Equilibrium studies in the system FeO–Al_2O_3–SiO_2. R. B. Snow and W. J. McCaughey. *Jour. Amer. Ceram. Soc.*, **25** [6] 151–60 (1942).—17 references, 5 figures.

Equilibriums of tin silicate with lead and iron in the fused state. V. I. Kolossov and N. N. Murach. *Metallurg*, **15** [3] 3–10 (1940); abstracted in *Chem. Zentr.*, **1941, I,** 630.—Experiments proved that the equilibrium $Pb + SnSiO_3 \rightleftarrows Sn + PbSiO_3$ obeys the law of mass action; it is reached at 1100°, 1200°, 1250°, 1300°, and 1350° in 40, 30, 20, and 15 min. With an increase in the temperature or in the SiO_2 content of the slag, the equilibrium is displaced either to the right or left. The equilibrium $Fe + SnSiO_3 \rightleftarrows Sn + FeSiO_3$ appears first at about 1250°, but with increasing temperature a displacement toward the right is observed; it obeys the law of mass action only when Fe:Sn = 1:1. When Fe:Sn = 2:1, 94% of the Sn is liberated from its silicate. Both reactions are endothermic (2000 to 4000 and 3500 to 7000 cal.). The equilibrium constants are 9×10^{-3} and 8.2×10^{-3}; they showed good agreement. Practice has shown that, when Pb is present, increased quantities of carbon are required for working. The melting of Sn silicate in the presence of Fe gives a higher Sn yield. M.V.C.

Estimation of barium sulfate in the presence of silica. B. R. Owells. *Chemist-Analyst*, **31** [1] 6 (1942).—Where a platinum crucible is not available, barium sulfate is separated from the oxides of silicon, aluminum, and iron by washing the weighed Gooch crucible repeatedly with hot concentrated sulfuric acid. Washing is complete when $BaSO_4$ no longer reprecipitates in water in the suction flask. A.P.

Fractional crystallization. A mathematical analysis of fractional crystallization problems in *n*-component systems. H. J. Garber and A. W. Goodman. *Jour. Phys. Chem.*, **45,** 573–88 (1941).—The effects of removing various amounts of a solvent from a salt solution are considered. By assuming linearity for unknown functions, answers to the equations can be written immediately, but considerable errors may thereby be introduced. In the *n*-component system, certain difficulties may arise peculiar to the particular system being considered; these difficulties are not discussed. R.A.G.

Frictional phenomena: VI, Measurement of the viscosity of liquids. A. Gemant. *Jour. Applied Physics*, **13,** 22–29 (1942).—Methods used for the measurement of the viscosity of liquids are based on (1) flow in capillaries, (2) shear between walls, (3) falling spheres, and (4) damping of waves. The fields of application and the limitations of each method are discussed. The Gemant-Southwell oscillation viscometer is dealt with in detail. For Part V see *Ceram. Abs.*, **21** [4] 91 (1942). A.P.

Glass electrode as a reference electrode in electrometric titrations. Louis Lykken and F. D. Tuemmler. *Ind. Eng. Chem., Anal. Ed.*, **14** [1] 67–69 (1942).—Illustrated. F.G.H.

Hydrolysis of salts in solution. H. F. Brown and J. A. Cranston. *Jour. Chem. Soc.* [London], **1940,** 578.—An apparatus for the preparation of solutions and the measurement of their pH values using a glass electrode without exposure to the atmosphere is described. Atmospheric contamination must be guarded against when the pH is less than two units removed from 7. A table of pH values obtained by interpolation at selected dilutions is given for 18 common salts in water. R.A.G.

Laboratory flowmeter with interchangeable precision-bore capillaries. Frank C. Croxton. *Ind. Eng. Chem., Anal. Ed.*, **14** [1] 69–70 (1942).—Illustrated. F.G.H.

Physics in 1941. T. H. Osgood. *Jour. Applied Physics*, **13,** 3–21 (1942). A.P.

Preparation of pigment mounts for microscopy. R. P. Allen. *Ind. Eng. Chem., Anal. Ed.*, **14** [1] 92–94 (1942).—Illustrated. F.G.H.

Quick analytical methods for the silicate industries: I, Silica. J. A. Merz. *Svensk Kem. Tid.*, **53,** 374–84 (1941).—M. attempted to work out a practical, reliable, and rapid analytical method for the determination of silica. The following methods were considered: (*a*) filter the sample, wash the precipitate with a hydrochloric acid solution of oxine (8-hydroxyquinoline), dry, ignite in a platinum crucible at dull-red heat, and weigh as $SiO_2 \cdot 12MoO_3$ (factor 0.03358); (*b*) filter, wash the precipitate, dissolve in hydrochloric acid, and determine the oxine quantity by titration with a standard solution of potassium bromate-potassium bromide; and (*c*) precipitate with a standard oxine solution, filter, and determine the excess of oxine in the aliquot of the filtrate by titration with a standard solution of potassium bromate-potassium bromide (Volynets method, *Ceram. Abs.*, **15** [10] 316 (1936)). As method *a* is not suitable as a quick method, only methods *b* and *c* were investigated. In spite of its theoretical advantages, method *b* was unreliable in practice, at least under the conditions given by Ginzburg (*ibid.*, **18** [9] 255 (1939)). By a suitable alteration of method *c*, a technique was developed for the determination of silica in solutions of water glass, the results of which agree within the range ±0.25% with those obtained by gravimetric analysis. The preparation of the solutions required and instructions for analysis are given.

Rapid determination of sodium oxide and potassium oxide in Portland cement. W. C. Hanna, L. N. Bryant, and T. A. Hicks. *ASTM Bull.*, No. 114, pp. 41–46 (1942).—The results of an investigation on the determination of Na_2O and K_2O in Portland cement are presented. Five methods were used by the twelve laboratories participating. The directions for the proposed method are as follows: Decompose a 2.0-gm. sample with HNO_3, $HClO_4$, and HF. Evaporate and heat to fumes of $HClO_4$, removing the excess. Take up the residue in water, filter, and dilute to 100 ml. Determine Na_2O in a 20-ml. aliquot as sodium zinc uranyl acetate. Use the remaining 75 ml. for the determination of K_2O, evaporating to 5 ml. and precipitating as potassium chloroplatinate. Several proposed definitions are as follows: (1) total alkali, for all compounds of the alkali metals determined as Na_2O and K_2O; (2) total alkali as Na_2O, for all compounds of alkali metals determined as sodium oxide and potassium oxide (the percentage of K_2O is multiplied by 0.658 to give its equivalent in Na_2O); (3) water-soluble alkali, for all compounds dissolving in water under the conditions stated in the A.S.T.M. method. B.C.R.

Rapid determination of sodium in waters and soil extracts. D. R. McCormick and W. E. Carlson. *Chemist-Analyst*, **31** [1] 15 (1942).—The uranyl zinc acetate method for sodium has been modified to give sufficient accuracy (5%) with increased speed and with a minimal cost of reagents. The precipitate is centrifuged and dissolved in 10 ml. of water; the transmission at 4000 to 4650 a.u. is measured in a colorimeter as a direct function of the sodium present. Calcium sulfate does not interfere as it does in the gravimetric method. A.P.

PATENTS

Double silicates of zirconium and method of making. C. J. Kinzie (Titanium Alloy Mfg. Co.). U. S. 2,273,871, Feb. 24, 1942 (June 12, 1934; Dec. 24, 1937).

Double silicates of zirconium and method of making. C. J. Kinzie (Titanium Alloy Mfg. Co.). U. S. 2,273,872, Feb. 24, 1942 (Dec. 29, 1937).—The method of making an opacifying calcium silicate zirconia crystalline complex which comprises heating an intimate mixture composed preponderately of finely milled zirconium silicate and a lesser amount of calcium carbonate, both ingredients being of particle sizes finer than 44 μ, at temperatures below fusion but sufficiently high to secure a substantially complete reaction and decomposition in the solid phase of the zirconium silicate and calcium carbonate to form the opacifying complex containing zirconium oxide interspersed in a calcium silicate matrix.

General

Acute lead poisoning. Contribution to the question of the toxicity of lead compounds by quantitative experiments. G. TARTLER. *Arch. Hyg. & Bakt.*, **125,** 273–92 (1941).—Guinea pigs were poisoned by oral doses of lead compounds increased daily so that death occurred after $4^1/_2$ days when the most poisonous was used. If the minimum lethal dose is taken as a measure, the following decreasing scale of toxicity was established: nitrate, chloride, lactate, red lead, oleate, carbonate, stearate, sulfide, and sulfate. Lead phosphate was found to be nonpoisonous. Extremely severe cramps were the dominating symptom of lead carbonate poisoning. Examination of the organs showed that the lead content of the whole brain of the poisoned animals never exceeded the normal content (10 gamma), even when death occurred. The lead content of the liver increased quickly and markedly, while that of the bones increased much more slowly and with greater individual variations. F.S.M.

Appraisal of disability resulting from occupational diseases. M. R. MAYERS. *N. Y. State Dept. Labor Ind. Bull.*, **20,** 251–54 (Sept., 1941).—M. discusses the difficulties in appraising a disability due to occupational disease. The starting point of any such appraisal is the "normal" which involves factors varying with the job. Among several particular difficulties mentioned, one is disagreement among physicians regarding percentage disability, especially when occupational disease is the cause of the disability. Another is the question of the patient returning to the work in which he contracted the occupational disease. Some diseases, such as silicosis and aniline bladder tumors, progress whether the occupation is continued or not. There are cases of decreased sensitivity, e.g., to carbon tetrachloride after working with the same material, of increased sensitivity, e.g., to carbon tetrachloride after chlorinated naphthalene poisoning, and of the common allergies. Psychological disturbances, such as those caused by carbon disulfide and lead, are also considered. M. lists some of the pitfalls to be avoided in the collection and interpretation of laboratory data on occupational diseases. F.S.M.

Bacteriological air analysis by the cloud-chamber method. S. D. ELLIOTT. *Lancet,* **241,** 514 (Nov. 1, 1941).—The method was developed for obtaining bacteria in a liquid medium rather than dry as in customary methods. The essential features are as follows: (1) the trapping of suspended particles by drawing the sample through a water-vapor mist, and (2) the condensation of water on any particles left in suspension by cooling the saturated air. This method indicated a fairly high degree of atmospheric pollution after spraying the air of a room, in contrast to the settling plate method which gave very low pollution values after spraying. F.S.M.

Cavities in the silicotic lung. Pathological study with clinical correlation. A. J. VORWALD. *Amer. Jour. Path.*, **17,** 709–18 (Sept., 1941).—V. describes the three types of cavities in the silicotic lung, viz., (1) those associated with typical tuberculosis little modified by coexistent silicosis; (2) those occurring in areas of silicotuberculosis resulting from combined local effect of tubercle bacilli and silica dust; and (3) those of the so-called anemic type that develop in massive areas of fibrosis but show no evidence of causative organisms or cellular reaction. The last are usually small, elongated, and slitlike. Their content resembles ink but is more fluid and not purulent. The inner zone of the cavity is an indefinite, ragged zone of seminecrotic tissue. There is an absence of histopathologic and bacteriologic evidence of infection. In areas of massive fibrosis the blood vessels become obliterated, and the resulting anemia is followed by areas of local necrosis which, because of autolysis, ultimately liquefy and excavate. F.S.M.

Chronic fatigue symptoms among industrial workers. R. V. WARD. *Can. Pub. Health Jour.*, **32,** 464–67 (Sept., 1941).—During the present speed-up in production there has been an increase in minor symptoms indicating fatigue in a group of industrial workers, including loss of appetite, insomnia, easy crying, irritability, and the feeling of fatigue itself. The physical signs most often found in these patients were loss of weight, increase in pulse rate, low blood pressure, tremor of out-stretched hands, and pallor. All the patients recovered after a period of rest. The illnesses most easily confused with the fatigue syndrome are pulmonary tuberculosis, hypochromic anemia, and hyperthyroidism. F.S.M.

Clarity of detail in X-ray screen pictures. E. SCHOPPER. *Veröffentl. wiss. Zentral-Lab. phot. Abt. AGFA,* **6,** 134–38 (1939).—The 2.5-fold increase in sensitivity of the new X-ray Fluorapid film brings about an improvement in the energy relation. A comparison of radiographic methods shows that the clarity of detail increases in the following order: fluorescent screen photography, use of paper, use of X-ray film. F.S.M.

Comparison of miniature roentgenograms and full-size films in serial examinations of workers exposed to dust. E. SAUPE. *Fortschr. Gebiete Roentgenstrahlen,* **62,** 145–59 (1940).—More than 25,000 workers in the ceramic industry and mines of Saxony have been examined. S. presents 12 pairs of pictures of roentgenograms; one is a reduction of a large film and the other an enlargement of a miniature, both being the same final size. It is possible to recognize silicosis in stage 2 (snowstorm or mottled lung) but not always silicosis in stage 1; asbestosis can be recognized in severe or medium cases but hardly ever in early cases. The miniature roentgenograms (22 x 24 mm.) compared with the normal films show the details simplified and coarsened, the sharpness lost, and the finest details invisible. Much has been accomplished by the use of miniatures, but they must be improved. F.S.M.

Coordination of industry with engineering colleges. WALTHER MATHESIUS. *Eng. Jour.*, **24** [9] 439–41 (1941).—Students of engineering colleges require a more adequate training in the basic fundamentals of knowledge and logic. Premature specialization in studies of a particular field tends to limit the scope of usefulness and the advancement to positions of greater importance in industry. One of the primary objectives of engineering schools is the training of the growing generation to meet the future requirements of operation and management in industrial enterprise and not to produce "specialists" on graduation. Such a limitation to a special field should be done later, if desired, and not because of educational limitations. **Discussion.** ROBERT E. MEHL. *Ibid.*, pp. 441–42.—The first function of an educator should be to present the fundamentals of science and engineering, leaving the numerous details of industrial processes to be learned later by experience in industry. Better cooperation between college and industry could be achieved if arrangements could be made to permit undergraduates to spend two to three summers working in the mills. B.C.R.

Determination of lead in biological materials. FREDERICK L. SMITH, II, THOMAS K. RATHMELL, AND THOMAS L. WILLIAMS. *Amer. Jour. Clin. Path.*, **11,** 653–68 (Aug., 1941).—The authors correlate their earlier work and include recent changes in the dithizone method of determining lead in blood, spinal fluid, urine, tissue, and bones. Reagents, cleaning procedures, specimen collection, and lead determination are described. The method consists essentially of the wet digestion of the sample, extraction with dithizone, and a titrimetric end point. The superiority of wet digestion lies principally in the time required for complete oxidation. F.S.M.

Dust counting by microprojection and comparison counting. D. H. HAMLY AND P. F. PULLEN. *Trans. Can. Inst. Mining & Met.*, **45,** 140–53 (1942).—At the University of Toronto a microprojector has been devised for showing dust particles and spots on konimeter slides and thermal precipitator cover slips. A method of comparison counting has also been devised whereby the projected image of the unknown is surrounded by eight positive transparencies of counted dust spots of the same magnification, thus bringing the comparison surfaces close together. Tests indicate that comparison counting by microprojection is

a sufficiently accurate short cut to dust counting to warrant further investigation. G.M.H.

Fatigue as a cause of high losses in production. Russell J. Waldo. *Can. Machinery*, **53** [1] 52–53 (1942).—Fatigue is largely controlled by the posture of the worker, and consequently production can be increased, scrap reduced, and accidents lessened by providing comfortable and well-designed seating facilities. E.D.M.

Glare in underground lighting—preliminary study. W. H. McMillan and S. Holmes. *Trans. Inst. Mining Engrs.* [London], **97,** 196–207 (1939).—Two types of glare are defined, viz., discomfort glare and disability glare. Both types are present in underground working. In coal mines, owing to the poor surface reflecting power of the surroundings, glare is acute. In the laboratory, disability glare, introduced by a lamp in the field of vision, was measured by the increase in brightness-difference threshold; this is the difference in brightness between a uniformly illuminated screen and a spot thrown on it which is just visible. The persistence of an image of a bright source was measured in other experiments. It was found to depend on the brightness of the source; disability glare depends only on the intensity of the light. An improved reflector and an opal glass for cap lamps is described, both of which reduce the variation in illumination over the illuminated area. L.R.B.

Impairment of vision due to glare in practical underground conditions. W. H. McMillan and S. Holmes. *Trans. Inst. Mining Engrs.* [London], **99,** 215–25 (1940).—Practical experiments were carried out with regard to glare in underground working. Discomfort glare from hand lamps can be obviated by fitting opal glasses; in cap lamps, reflectors cut down side illumination. Beam-type cap lamps fitted with a headpiece to give more diffused light are advisable for workers infrequently at the coal face. L.R.B.

Investigation of public eating and drinking establishments in Providence, Rhode Island. M. P. Horwood and P. J. Pesare. *U. S. Pub. Health Repts.*, **57** [2] 33–44 (1942).—The eating and drinking establishments investigated included 18 restaurants, 8 soda fountains, 10 cafés, and 19 barrooms; the investigation was conducted in the summer of 1938. Each place was visited twice, the two visits being made within 3 to 5 days of each other and with no advance notice. On the first visit, a score card was checked for 12 items, representing in detail the condition of the rooms and equipment used, especially at rush hours. The second visit was confined to a detailed study of the dishwashing facilities available and the methods employed. Total bacterial counts derived from public eating utensils after 48 hr. of testing are tabulated, and the predominating organisms are discussed. Dishwashing methods are tabulated according to the temperatures of the wash water and the rinsing water, and aspects of processes in use are discussed. The inquiry shows the need of an educational campaign among both managers and patrons of such establishments. K.R.

Microchemistry solves big industrial problems. K. M. Swezey. *Popular Science Monthly*, **140** [4] 49–51 (1942).—Westinghouse research laboratories have utilized microchemistry in solving more than a hundred problems involving films of corrosion and tarnish. A.P.

Micro-cleanliness in the washroom. C. R. Whittington. *Nat. Safety News*, **43,** 54, 72 (Dec., 1941).—Hypochlorites (solutions of sodium or calcium hypochlorite) are recommended as the most effective disinfectants. They are nontoxic. They destroy odors rather than mask them and destroy filterable viruses. Solutions for various purposes vary in available chlorine content from 100 to 5000 p.p.m. In general, it is best to make a solution containing 10,000 p.p.m. of available chlorine and to dilute it as needed. Various applications are described. F.S.M.

Mobilization of industrial hygiene for national defense. W. J. McConnell. *Amer. Jour. Pub. Health*, **32** [1] 9–14 (1942).—McC. reviews the developments in industrial hygiene activities in the U. S. since 1914. The activities of several organizations now engaged in this work are discussed. B.C.R.

One hundred million dollar premium. C. A. Togut. *Ind. Med.*, **10** [5] 182–84 (1941).—Approximately 40 million dollars are likely to be paid as disability and death benefits under Workmen's Compensation Insurance, with an accompanying 18 million dollars for services of physicians, surgeons, and hospitals. Estimates based on experience since 1914 when this compensation insurance was introduced into the U. S. indicate that at least 500,000 workers in New York State will meet with injuries in 1941, due to their inexpert operation of machines and equipment, and that about 100,000 of these will need to be hospitalized. Vigorous safety and educational campaigns should therefore be undertaken among employee groups to acquaint them with the plant as a whole and its equipment. Since 1935, the injured employee has had the right to choose his own physician. This did away with many previous causes of discontent but introduced a number of others involving cooperative relations between insurance carriers, their doctors, and the employee's doctor. These are enumerated in detail. T. suggests ways of controlling all such frictions in the interest of speeding up the procedure for the patients. He also suggests needed amendments to the basic law. K.R.

Pounds of prevention. R. E. Kelly and L. A. Watt. *Monsanto Mag.*, **20,** 16–19 (Dec., 1941).—The toxicological work conducted by the Monsanto Chemical Co. on new products so that injury which might otherwise occur may be prevented is described. The principal toxicological work for the company is performed at various leading universities. The work of the National Institute of Health is also mentioned. The authors state, "In its toxicological investigations, industry comes closer to being noncompetitive than in any other phase of its operations. There is a free exchange of information between the workers at Du Pont's Haskell Laboratory, the Dow Chemical Co. toxicologists, the Carbon & Carbide group at Mellon Institute, and various others, all of whom are working toward a common end. This end is to advance the frontier of our understanding and to pave the way for better use of the products which flow from the research laboratories." F.S.M.

Recovery of damages because of contraction of silicosis. Anon. *U. S. Pub. Health Repts.*, **56,** 400–401 (Feb. 28, 1941).—In an action to recover damages, the plaintiff (Rebel, a welder) proved that he had contracted silicosis in the employ of the defendant company (Standard Sanitary Mfg. Co.) while working in the welding room into which poured deleterious dust from the grinding and sandblasting room where the exhaust fans were insufficient to carry off the dust. In the trial court, the plaintiff won. The Pennsylvania statute required exhaust fans to be of sufficient power to carry off poisonous fumes, gases, and dust from emery wheels, grindstones, and other machinery creating dust. The company appealed the case. The Pennsylvania Supreme Court, however, decided in favor of the plaintiff on the grounds that (1) the legislation placed a definite responsibility on the employer which could not be successfully controverted, it being well settled that a violation of the statute which resulted in injury to the employee made the employer liable for damages in a common-law action; (2) the plaintiff was required to show only that the exhaust fans in use were not in sufficient compliance with the provisions of the statute; (3) the fact that the welder had assumed the risk in accepting the employment was untenable, as there was nothing in employment as a welder that presupposed any scientific knowledge of the properties of silica dust and their injurious effect upon the body; (4) the fact that the statute violated had been repealed in 1937 had not impaired the vested right possessed by the plaintiff in 1935 when he brought suit for damages under the statute which was then in force. K.R.

Registration of physicians under the Workmen's Compensation Law and requirements for advancement in ratings and qualifications. Hugh J. Murphy. *Ind. Med.*, 10 [5] 200–203 (1941).—M. submits the standards and requirements for physicians in New York State who desire to register under the Workmen's Compensation Law.

They must qualify in any one of the following major medical specialties: major surgery or orthopedic surgery; roentgenology; ophthalmology; laryngology, rhinology, and otology; dermatology and syphilology; neurology and psychiatry; or physical therapy. To date, 19,421 physicians have been authorized to treat such compensation cases. Of the 22,000 physicians licensed to practice in the State of New York, nearly all are authorized to do compensation work. K.R.

Report of meeting of Ceramic Educational Council, March, 1941. PAUL G. HEROLD, Secretary. *Bull. Amer. Ceram. Soc.*, **21** [3] 44–45 (1942).

Rouge for buffing and pulmonary tuberculosis. ANON. *Jour. Amer. Med. Assn., Queries & Minor Notes*, **117**, 1492 (Oct. 25, 1941).—A young man working with two rouges for buffing showed signs of tuberculosis and had an infiltration of the upper chest as revealed by a roentgenogram. One of the materials was slate colored, and the other was the color of ordinary rouge. Without knowledge of the composition of the particular materials, it is impossible to prognosticate their effects on the lungs. Rouge used for buffing is ordinarily composed of iron oxide, which does not produce serious pulmonary reaction unless contaminated by a high percentage of free silica. The roentgenogram is more suggestive of an infectious process than of a silicotic process, but if the mineral contains free silica, the process may be a combination of silicotic and tuberculous changes. F.S.M.

Sanitization of tableware. R. C. STRONG. *Ind. Med.*, **11** [1] 10–12 (1942).—Improperly cleansed tableware may transmit disease; it should therefore be a concern of the industrial physician. The highest accepted standard of cleanliness for properly washed tableware is in the Sanitary Code of New York State, which requires that all eating, drinking, and cooking utensils are to be so cleansed and disinfected as to be free of bacilli of the colon group and to have a total bacterial count of not more than 100 per utensil. Such tableware is termed "sanitized" without being necessarily sterile. A good dishwashing machine should fulfill 10 conditions in its operation; temperatures of not over 120°F. for clean washwater and of 170° for the rinsing water are the prime requisites for sanitization. The active qualities of a good detergent, which is essential for use in the washwater, are defined. Simple tests for determining the indispensable pH strength of the washwater are given. The high temperature of the rinsing water does away with towel drying, but metalware and glassware may be acceptably dried with clean towels. When clean and dry, all tableware and silver should be handled as little as possible and should be stored in closed cupboards until needed. After glasses are washed and rinsed, they may be stored, bottoms up, in wire racks without handling. 6 references. K.R.

Sick absenteeism in the nonferrous mining industry. ANDREW FLETCHER. *Mining Congress Jour.*, **26** [12] 39–41 (1940).—There are 12 times as many shifts lost through absenteeism as through accidents. W.D.F.

Silicosis in Stourbridge fire-clay miners. S. DEANER. *Lancet*, **241**, 417–20 (Oct. 11, 1941).—Three cases of silicosis were found among fire-clay miners at Stourbridge, England, where the hazard was not previously suspected. Samples of the two types of clay contained 7.2 to 36.1% of free silica. One of the cases was diagnosed as silicoanthracosis; the other two were typical of silicosis. F.S.M.

Sources of scientific information. T. E. R. SINGER. *Chem. Industries*, **45** [4] 417, 419, 423 (1939).—A list of the major chemical dictionaries, English-foreign language scientific dictionaries, tables of physical and chemical constants, abstract journals, and personnel directories is presented. E.D.M.

Two hundred cases of silicosis—initial forms. M. CONROZIER AND J. MAGNIN. *Med. du Travail*, **13**, 5–55 (1941).—Many good roentgenograms and case histories of typical silicotics from the coal district of Gard are presented. The silica (presumably quartz) content of the rock is 87%, and protective measures are lacking or inadequate. Silicosis is therefore widespread. No miner working more than three years is free from fibrosis, and more than half of the men in their sixth year of work have definite silicosis. Tuberculosis is rare. X rays show nodules in many men without fever or bacilli who are seemingly in good health but are short of breath and unable to work. The authors are convinced that silicosis may exist without tuberculosis, but French industrial physicians and some scientists still differ on this point. F.S.M.

Wall materials and lighting. PARRY MOON. *Jour. Optical Soc. Amer.*, **31**, 723–29 (1941).—M. presents data on light reflection from 87 commercially available wall materials; they are applied to the calculation of wall and ceiling luminosities in rooms. White walls are superior for economy, reduced contrasts, and better color discrimination. A.P.

SEPARATE PUBLICATIONS

Electron Microscope. J. HILLIER AND H. E. RHEA. *Penna. Dept. Labor & Ind. Safe Practice Bull.*, No. 87, 6 pp. (Sept., 1941).—The history of the development of the microscope, culminating in the invention of the electron microscope, is reviewed briefly. The theory of the electron microscope is presented, and the instrument is described with diagrams and illustrations. It will have numerous applications in industry and in medicine; it can be used for the study of filterable viruses and in other bacteriological fields. The importance to industrial hygiene is indicated. The submicron sizes of silica and other dusts which are admitted to be among the most dangerous can be readily studied. F.S.M.

Engineering as a Career. Engineers' Council for Professional Development, 29 West 39th St., New York, 1942. 36 pp. Price 10¢, $7.50 per 100.—The booklet is planned to help students decide whether they are fitted to be engineers by giving them a general picture of the characteristics and requirements common to all branches of the profession and discussing the qualities and aptitudes needed by engineers. The section on the scope of engineering includes discussions of what engineering is and what engineers do, the functions of engineering, the "engineering method," answers to the question, "Who should study engineering?", an outline of the necessary preparation for such a career, and a survey of probable opportunities and earnings. The second section presents more detailed accounts of the activities of engineers in the various branches of the profession. The interrelationships among various types of engineering are stressed, and consideration is given to the use of engineering training in other fields of activity. The booklet is intended to give the high-school student, in language that he can understand, the facts he needs to help him choose his career. A list of vocation-guidance books and pamphlets primarily concerned with engineering and related vocations is included.

Proceedings of the 19th Convention on Silicosis, Turin, February, 1941 (Atti del Convegno sulla Silicose). National Society of Propaganda for Prevention of Misfortune, 1941. 236 pp. K.R.

Reports of Committees and Resolutions Adopted by Eighth National Conference on Labor Legislation, Nov., 1941. *U. S. Dept. Labor, Div. Labor Standards, Bull.*, No. 52-A, 23 pp. (1941).—The Committee on State Labor Laws and National Defense reported that comparatively few requests for relaxation of labor laws have been received and that many of the requests have come from nondefense firms. The committee has considered action under two types of state laws, i.e., those which grant no discretionary power and those which allow for administrative exceptions. Certain restrictive regulations were recommended for use with the latter type. The report of the Committee on Safety and Health Program and National Defense contains the following recommendations: (1) Workmen's Compensation acts should be compulsory as to type and should apply to all employments. (2) Such acts should provide benefits for all occupational disease disabilities. (3) Necessary medical and hospital care should be provided without specific limits as to cost and time. (4) Administration of the acts should be kept informal and

nontechnical, and adequate provision should be made to protect the interest of claimants whenever agreement settlements are permitted. (5) Appeals to the courts from awards and decisions should be allowed only on questions of law. (6) Cost of workmen's compensation administration should be prorated among insurance carriers and self-insurers, and the operating cost of state funds should be paid out of premium income. The extension of workmen's compensation coverage to include all interstate commerce operations is also recommended. Relaxation of physical requirements for employment during the present emergency should not decrease the extent of medical control programs. In fact, the data now obtained on the otherwise unemployable will be of great value. It is strongly recommended that industrial hygiene departments be established in all state labor departments. Priority classifications should be adjusted so that an ample supply of personal protective equipment can be made available. Reports were also submitted by committees on Education and Training, Labor Supply and Training, and Priorities, Industrial Relations, and Resolutions. F.S.M.

Workmen's Compensation Silicosis Fund. C. L. HEABERLIN, Chairman. Seventh Annual Report of the Silicosis Division, Department of Workmen's Compensation, Charleston, W. Va., for the year ending June 30, 1941. 15 pp.—In West Virginia, the Workmen's Compensation Silicosis Act provides compensation benefits for silicosis only An employer may or may not elect to have its provisions apply. As of June 30, 1941, there were 29 employers, with 48,648 employees, operating as self-insurers under the act. The report includes a financial statement, an account of activities of the Silicosis Division, a table of premium rates, a list of functions of the Silicosis Division, a brief description of silicosis, and a claim record. According to this law, $500 is awarded claims for first-stage silicosis, $1000 for second-stage, and, for third-stage, compensation for life at a rate of $8 to $16 per week. From 1935 to 1941, 85 cases of silicosis or alleged silicosis have been reported to the department. Of these, 32 claims were awarded and 33 denied, the remainder being claims still pending; in 6 cases no application was filed. F.S.M.

PATENTS

Manufacture of artificially colored granules. M. R. BEASLEY (Bird & Son, Inc.). U. S. 2,273,827, Feb. 24, 1942 (June 16, 1939).—The method of making colored granules which consists in first providing serpentine granular base material, then applying to the granules a liquid coating of sodium silicate having therein a coloring pigment, and finally heating the granules thus coated to a temperature sufficiently high to react the coating *in situ* with the serpentine base material and produce on the granules a hard insoluble colored exterior coating.

Manufacture of artificially colored granules. E. M. LINES (Bird & Son, Inc.) U. S. 2,273,874, Feb. 24, 1942 (June 17, 1939).

Any Spare Time?

. . . We Need Abstracters

The following journals are at present unassigned. An abstracter for any of these journals should have the journal available and be prepared to submit abstracts regularly each month. Address all requests for assignments to the office of *Ceramic Abstracts*, 2525 N. High St., Columbus, Ohio.

Amer. Architect
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Eng. News-Record

Factory Management & Maintenance

Illinois State Geol. Survey Bull., Information Circ., Rept. of Investigations
Ind. Finishing
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Jour. Amer. Soc. Agron.
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December 19, 1939	1876	237	27	642	220	3002
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December 21, 1941	2029	257	37	609	220	3152
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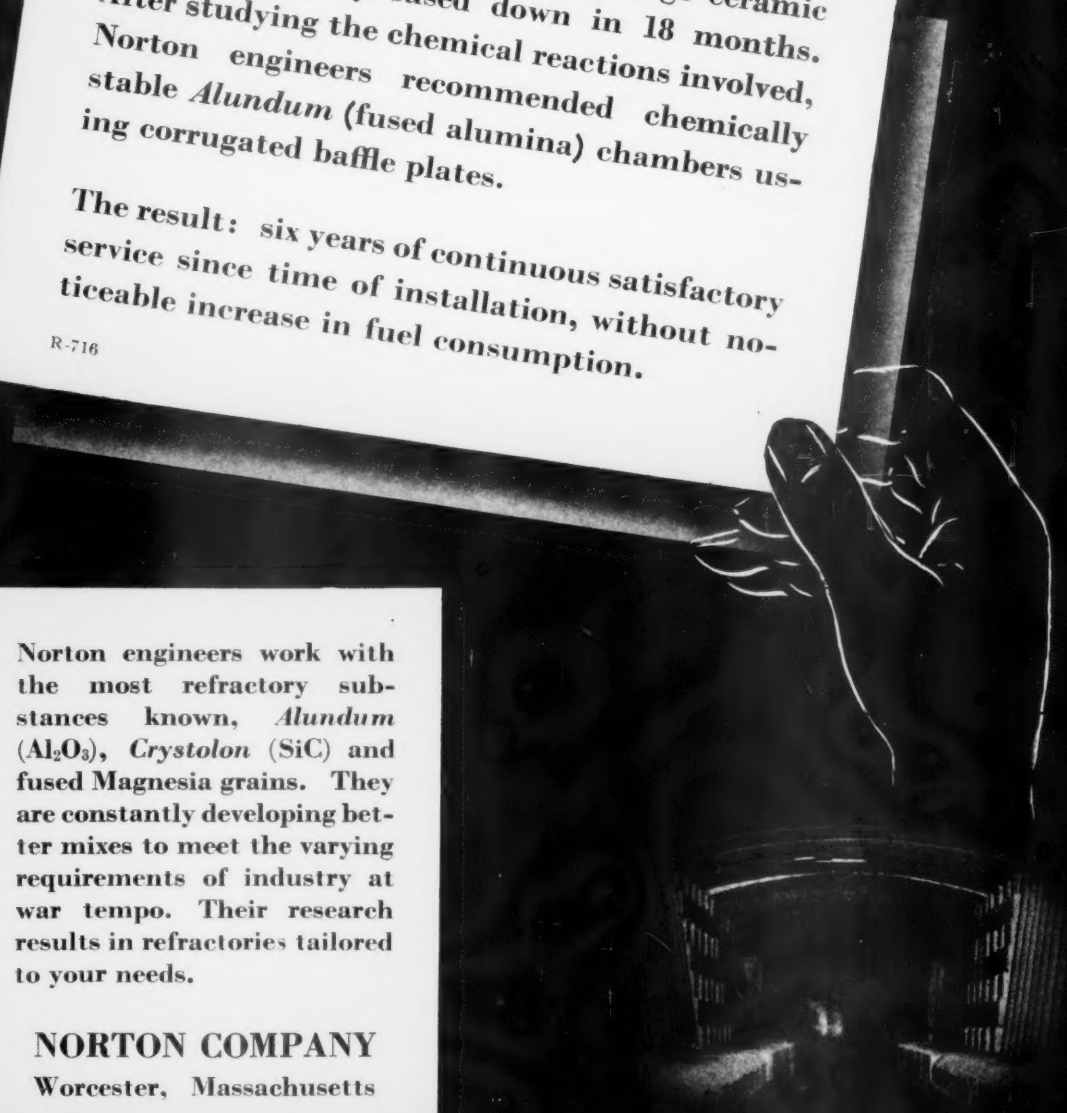

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Personal

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BEHRINGER, HAROLD, Tygart Valley Glass Co., Washington, Pa. (formerly in name of Robert Goins).

BEST, ARTHUR P., Philips Blackburn Works, Ltd., Blackburn, Lancashire, England; research chemist.

BOYLES, JOHN P., 409 E. Lincoln Ave., New Castle, Pa.; assistant superintendent, Shenango Pottery Co.

BULLOCK, C. L., East Liverpool, Ohio; commercial and industrial manager, Ohio Power Co.

CROSS, RICHARD B., 137 Newbury St., Boston, Mass.; secretary and assistant director, New England Industrial Research Foundation.

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MOTTER, A. R., Pacific Clay Products, 306 West Ave. 26, Los Angeles, Calif.; development engineer.

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STARK, IRA A., 102 N. Galt Ave., Louisville, Ky.; chemist, E. I. du Pont de Nemours & Co., Inc.

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Massachusetts Institute of Technology: ROBERT J. ANICETTI, L. WARREN COUGHANOUR, PETER JOHNSON, AND WILLIS G. LAWRENCE.

San Jose State College: MARION C. WILKINS.

University of Toronto: BENJAMIN L. MATTHEWS.

ROSTER CHANGES DURING APRIL†

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ARNOLD, THOMAS M., Red Wing Potteries, Inc., Red Wing, Minn. (Cincinnati, Ohio)

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HOSTETTER, JOHN R., War Production Board, Glass Unit, Chemicals & Allied Products Branch, Washington, D. C. (Staten Island, N. Y.)

HULL, WALTER A., Atlas Lumnite Cement Co., Buffington, Ind. (Santa Fe, N. Mex.)

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TRABERT, LOREN A., 717 North Union, Fostoria, Ohio (Antioch, Ill.)

WEBSTER, PAUL A., Moravia Road, Avon, Conn. (Bloomfield, Conn.)

WHITWOOD, ROBERT A., 2197 Seneca St., Buffalo, N. Y. (Boston, Mass.)

---

† Address in parentheses is former address.

MEMBERSHIP WORKERS' RECORD

Corporation

Office	3

Personal

C. E. Bales	1	J. C. Hostetter	1
R. E. Birch	1	C. J. Kinzie	1
L. H. Brown	1	H. M. Kraner	1
R. M. Campbell	1	W. E. S. Turner	1
R. L. Gibson	1	J. M. Volzer	1
J. H. Gill	1	Office	6

Student

A. L. Johnson	4	H. H. Sanders	1
R. J. Montgomery	1		

Grand Total	**26**

CORPORATION MEMBERSHIPS ARE PROFITABLE INVESTMENTS

THE BULLETIN

OF

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Lulu Scott Backus, Director of the Department of Ceramics Rochester Athenaeum and Mechanics Institute, Rochester, New York

Lulu Scott Backus, Director of the Department of Ceramics at the Rochester Athenaeum and Mechanics Institute in Rochester, New York, is the daughter of Helen Gertrude Smith and George Calvin Brown. She was born at Town Pump, Ogden, New York, where both her maternal and paternal grandparents had settled after leaving their New England homes.

Mrs. Backus cannot remember a time when she was not interested in pottery. Her earliest recollections are connected with the making of mud pies under the old apple tree. One day, as she lamented the lack of color, her mother, who was most sympathetic and understanding, brought her a lovely little turquoise pitcher and, breaking it into bits, taught her to inlay borders on her precious

pieces. This opened an entirely new field and every bit of colored glass, shell, and broken crockery ware was hoarded and utilized. This unusual interest in color and design led later to her many experiments with glazes for which she is so widely noted.

Another memory centers around the shop where she was taught the use and handling of tools and equipment by her grandfather, a sturdy old New England craftsman and musician, who believed that every child, boy or girl, should be taught to play some musical instrument and have a trade regardless of all the "book learning" in the world. The rigid standard which she had to maintain to meet her grandfather's approval is no doubt responsible, in a large part, for the perfection of shape which characterizes her lovely bowls and vases of classical design.

Education

Mrs. Backus received her early education in a district school. Later, she entered Brockport State Normal and, having completed the four-year classical course, was graduated from that institution. After graduation, she became principal of one of the three grade schools in the village. This position she held until these three schools were consolidated. The consolidation made possible a special teacher of drawing and music, and this position was given to Mrs. Backus at her request. At the end of three years, she entered the Rochester Athenaeum and Mechanics Institute, where she completed the art and craft teacher training courses. She did postgraduate work in metalry, jewelry, and pottery with Theodore Handford Pond, one-time head of the Art School and afterward director of the Dayton Art Institute, Dayton, Ohio. Later, she specialized in ceramics at Alfred University, Alfred, New York, where she worked under Charles F. Binns, one of the best-known potters of the time.

Became Head of Craft

In 1918, after eight years of professional work in handwrought jewelry, she returned to Mechanics Institute as head of the Craft and Ceramic Department. During this war period, she was called upon to teach not only the various crafts but to conduct classes in occupational therapy, a work in which the Institute was a pioneer.

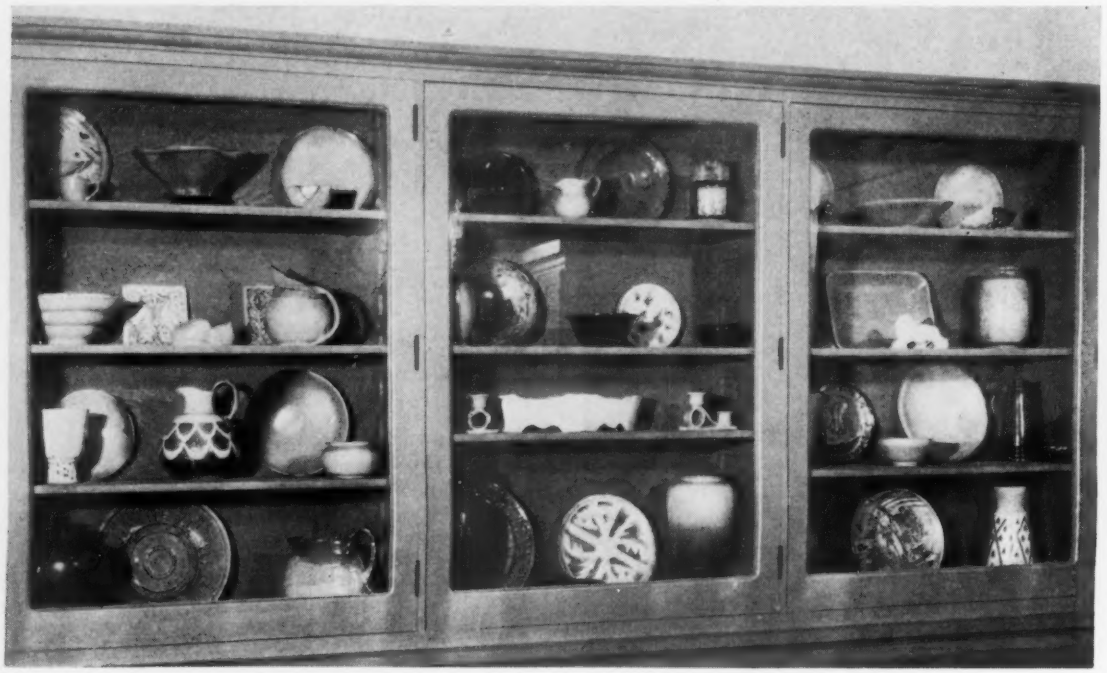
Rehabilitation Work

The next five years were spent in rehabilitation work, the Institute being one of the leading spirits in this movement. During these years, many of the returned soldiers selected pottery, and the rooms were alive and humming with activity. It was found that work in clay was not only restful and relaxing to these men but that it helped to overcome many a fixation. One, afraid of a pencil, found he could draw; another, fearing tools, thought it was good fun to cut spouts and handles of solid plaster for teapot covers. This gave him the necessary confidence to take up a class in metalry, molding, or toolmaking, and the skill gained in pottery increased his accuracy and interest.

Her Hobby

Mrs. Backus' hobby is glazes, and, during all this period of teaching, she was constantly experimenting for new colors and textures.

"The reason I love to make pottery," she says, "is that I may have something on which to try the glazes and glaze combinations I so love to develop. As I do not paint, I try to make these glazes express light, shade, and feeling



Wall cases in the Department of Ceramics, Mechanics Institute, Rochester, New York.

In other words, I want them to live and to be something more than waterproofing for a piece of biscuit ware."

In 1927, she was given the Lillian Fairchild Memorial Award from the University of Rochester for her exhibition of pottery in the Memorial Art Gallery and for the most notable contribution to artistic advancement in glaze research in and near Rochester during that year.

Adult Education

In October, 1930, it was her good fortune to meet L. P. Jacks when he visited Rochester. He visited her pottery rooms and talked about adult education, a subject close to his heart, inasmuch as he was connected with Manchester College, Oxford, England, where the work had been started so successfully. Mrs. Backus was much interested and surprised when, on leaving, he turned to her and said, "You could do this most successfully if you tried. The world needs this sort of thing. There is such a scarcity of work that people must be kept happy and given interesting things to do with the hands if we wish to keep them contented. A contented nation means a peaceful country, and I know of no medium better adapted or more suitable with which to accomplish this than sympathetic clay."

Pottery made by Lulu Scott Backus.

With this thought of Dr. Jacks in mind, Mrs. Backus was ready to meet the depression when it arrived. Mechanics Institute, obliged to retrench, dropped ceramics from the curricula of its day classes. Allowed the use of the school shops, Mrs. Backus took up adult education for leisure time in earnest and became head of the Y.W.C.A. Arts and Crafts Hobby Shop. Many an older person who had lost his job came to these shops seeking some profitable way to fill the empty days. Not one was turned away until something had been definitely planned to fit his particular needs. For one, it was a hooked rug or the piecing of a quilt; for another, toymaking, modeling, or pottery. Whichever he chose, a new world of absorbing interest and pleasure was opened to him.

The depression having passed its peak, Mechanics Institute, under its able new president, Mark Ellingson, began once more to build up its Ceramic Department. During the summer of 1940, this Department was redecorated and equipped. Its lighting system, new equipment, chemical laboratory, and its many conveniences and pleasing arrangement of cases and cupboards make it one of the most outstanding departments of its kind in the United States, and it has attracted the attention of educators and craftsmen from far and near. It is also an inspiration to the students, and the classes have never been so largely attended or so interesting.

The work never becomes monotonous, for Mrs. Backus recognizes the need for self-expression and encourages the students to translate their many and varied ideas in terms of clay. She emphasizes her belief that there is so much more to the art of ceramics than knowing how to build, to turn a form on a wheel, or how to explore the stubborn secrets of fired clay and glaze. Although this knowledge is most essential, she feels that it will never take a potter very far unless his imagination can guide his hands to do what a machine can never do.

In offering these adult courses in ceramics, the Institute has no thought of competing with industry. On the contrary, the object has been to give to many an older person a better outlook on life by helping him to see the beauty about him through the medium of clay. Some enter the classes with only this objective, some to develop a hobby which will give pleasure when working days are over, some for college credit, and others for rehabilitation. Many of these have either returned to their jobs better in mind and spirit or have secured a more promising position. Several blind people have also been benefited. In all cases, the results have been satisfactory and beyond the school's expectations.

Industry has at last become interested and awakened to the need of this type of teaching and is sending workmen to classes taught by Mrs. Backus. Doctors, recognizing the therapeutic value of this work, send patients, and hospitals encourage their nurses to attend. Principals of many of the high schools in and near Rochester are also urging their teachers to attend, with the expectation of adding this fascinating subject to their curricula.

Pieces made by the blind in the Department of Ceramics, Mechanics Institute, Rochester, New York.

These early efforts in adult education in Rochester have led to the opening of ceramic shops in other communities. A group of Cornell University women started the work in Ithaca, New York; Geneseo Normal School in Geneseo, New York, introduced a course; and Linn Phelan, a former student of Mrs. Backus, is carrying on similar work at the Lindwood Pottery, Saco, Maine.

New Garden Ware

At the present time, Mrs. Backus is experimenting with a new body for garden ware. She finds that by adding a

variety of vegetable fibers to the clay, she has a most interesting texture when these materials are fired in the kiln. The ware, although coarser, does not leak, has a delightful ring, and is far stronger and more durable than clay and grog alone. Some interesting examples of this ware were recently shown in the Barbizon Plaza Art Galleries of the Barbizon Plaza Hotel, New York, N. Y. One piece of ware shown was accepted for the International Exhibition.

Society Memberships

Mrs. Backus is a member of The American Ceramic Society, the New York Society of Ceramic Arts, and the Memorial Art Gallery of Rochester. She has exhibited at Annual Meetings of The American Ceramic Society in Chicago, Detroit, Pittsburgh, and Cleveland, and with the New York Society of Ceramic Arts. She has also exhibited at the National Ceramic Exhibition held at the Syracuse Museum of Fine Arts; the Art Alliance of Philadelphia; the Telfair Academy, Savannah, Georgia (at the request of the Federation of Arts); the Memorial Art Gallery and the Rundel Library of Rochester, New York; the 1939 world's fairs; and other galleries throughout the United States. There are also several pieces of her work on exhibition in Europe.

LOUIS JACOB TROSTEL
PRESIDENT OF THE AMERICAN CERAMIC SOCIETY, 1942–1943

Louis J. Trostel, chief chemist of the General Refractories Co., Baltimore, Md., was born December 31, 1893, at Galion, Ohio. He attended grade school in Tiffin, Ohio, and was graduated from the high school in that city in 1912. He then attended Ohio State University in Columbus, Ohio, where he received the Bachelor of Chemical Engineering degree in 1918. During his senior year, he enlisted in the Engineer Reserve Corps of the United States Army.

Louis Jacob Trostel

Immediately following his graduation from the University, Mr. Trostel was associated for five months with the British War Mission in the United States for the procurement of munitions. From December, 1918, to December, 1919, he was employed by the Standard Chemical Co., Pittsburgh, Pa. (manufacturers of radium from carnotite ore). From January, 1920, to November, 1921, he was engaged as junior chemist at the U. S. Bureau of Mines, Pittsburgh, Pa., where he studied gases, dusts, etc. From December, 1921, to February, 1923, he was assistant engineer with the U. S. Bureau of Chemistry, Washington, D. C., where he worked on the prevention of dust explosions. In February, 1923, Mr. Trostel became associated with the American Refractories Company at Joliet, Ill. This Company was absorbed by the General Refractories Company a short time later, and in 1926 Mr. Trostel moved to Baltimore, Md.

Married in 1925 to Katharine Fisher (deceased in 1939) of Columbus, Ohio, Mr. Trostel is the father of two sons, Louis, Jr., born May 21, 1927, and Michael F., born May 19, 1931.

Professional Degrees

Mr. Trostel received professional degrees in chemical engineering and in ceramic engineering from Ohio State University in 1936 and in 1937.

Activities in The American Ceramic Society

Mr. Trostel became a member of The American Ceramic Society in 1923. Affiliated with the Refractories Division, he served as chairman of this Division in 1928–1929.

In 1931, he was elected a Fellow of The Society. In 1933–1934, he served as vice-president of The Society and as a member of the Publications Committee.

Membership in Other Technical Societies, etc.

Mr. Trostel is also a member of the Canadian Ceramic Society, the Ohio Ceramic Industries Association, the American Refractories Institute (member of its Technical Advisory Committee), the American Society for Testing Materials (secretary of Committee C-8 on Refractories from 1926 to 1932), the American Institute of Chemical Engineers, the Institute of Ceramic Engineers, the American Chemical Society, and Alpha Chi Sigma, professional chemical fraternity. He has also served on the Joint Committee on Foundry Refractories (sponsored by the American Foundrymen's Association, the American Society for Testing Materials, and The American Ceramic Society) and on the Special Committee on Boiler Refractories of the American Institute of Mining and Metallurgical Engineers.

Publications

Mr. Trostel is the author of twenty-one papers, twelve of which pertain to the ceramic field.

(1) "Notes on a Comparative Test of Quicklimes for Silica Brick Manufacture," *Jour. Amer. Ceram. Soc.*, **7** [6] 452–54 (1924).

(2) "Laboratory for Technical Control of Manufacture of Refractories," *Bull. Amer. Ceram. Soc.*, **7** [9] 260–67 (1928).

(3) "Maker and User of Refractories Gain Through

Technical Control," *Chem. & Met. Eng.*, **36** [3] 148–50 (1929).

(4) "Control Testing of Fired Brick from Viewpoint of A.S.T.M. Methods" (Part XI of Symposium on Control Testing in Clay Firebrick Manufacture at Thirty-Fourth Annual Meeting of The American Ceramic Society), *Bull. Amer. Ceram. Soc.*, **11** [7] 184–86 (1932).

(5) "Applying Petrographic Methods to Refractories Research," *Amer. Refrac. Inst. Tech. Bull.*, No. 37, 7 pp. (April, 1933).

(6) "New Developments and Trends in Refractories Processes and Materials, I–III," *Trans. Amer. Inst. Chem. Engrs.*, **31** [3] 473–93 (Sept., 1935).

(7) (With R. P. Heuer) "Refractories Used in Lime Burning," *Pit & Quarry*, **29** [2] 48–53 (1936).

(8) "Quartz as a Devitrification Product of Vitreous Silica," *Jour. Amer. Ceram. Soc.*, **19** [10] 271–75 (1936).

(9) "Modern Refractories for the Steel Industry," *Iron & Steel Engr.*, **14** [3] 24–35 (1937).

(10) "Relation of Refractories to the Chemical Engineering Industries," *Hexagon*, **27** [7] 339–47 (April, 1937).

(11) "Absorption of Magnesia by Chromite Spinel," *Jour. Amer. Ceram. Soc.*, **22** [2] 46–50 (1939).

(12) (With D. J. Wynne) "Determination of Quartz (Free Silica) in Refractory Clays," *ibid.*, **23** [1] 18–22 (1940).

Patents

(1) "Process of Making Refractory Composition and Articles Therefrom," U. S. Pat. 1,716,395, June 11, 1929.

(2) "Refractory Composition and Process of Making Refractory Articles Therefrom," U. S. Pat. 1,752,867, April 1, 1930.

MAJOR EDWARD HOLMES
VICE-PRESIDENT OF THE AMERICAN CERAMIC SOCIETY, 1942–1943

Major Edward Holmes was born at LaGrange, Ky., on January 8, 1882. When he was thirteen, his family moved to Kempton, Ind., where he finished his high-school education. Securing a state teacher's license in 1901, he began a brief teaching career in the public schools of Indiana. He taught one year in the country school of New York, Ind., followed by one year in the grades of the Kempton school. After one year of preparatory work at Valparaiso University, he became principal of the Goldsmith, Ind., public schools (1904–1905) and the following year became principal of the Jefferson Township Consolidated Schools at his home town of Kempton, Ind. (1905–1906).

In 1906, Dr. Holmes entered Indiana University at Bloomington, Ind. During his senior year there he was both student and instructor. He received his B.A. degree in 1908 and the same year entered Cornell University as student and instructor. He received his M.A. degree in 1910, specializing in physical chemistry and economic geology.

From 1910 to 1918, Dr. Holmes was employed as a research engineer by the National Carbon Company, Cleveland, Ohio, in charge of research on electrical dry cells. During this time, he was the author of numerous scientific and engineering articles for the confidential files of the National Carbon Company. His work resulted in important developments in dry cells, particularly in connection with the use of artifical manganese and gas black as a means of improving the depolarizing efficiency of the dry cell mix. Some of this work is covered by patents. During the first World War his work was directed toward the development of special dry cells for the United States Government.

In 1918, he returned to Cornell University to complete the work for a Ph.D. degree and was granted a fellowship for this purpose. He was awarded the Ph.D. degree in 1918. His research work for the Ph.D. degree was applied to the chemistry of the hydronitrogens. This work was published in the *Journal of the American Chemical Society*.

In 1920, Dr. Holmes began his career in ceramics. He was with the National Lime Association of Washington, D. C., from 1920 to 1923, serving successively as manager of the Chemical Department and Acting General Manager. In 1923–1924, he was employed by the U. S. Gypsum Company, Chicago, Ill., as development engineer. In 1924–1926, as development engineer for Dolomite, Inc., of Cleveland, Ohio, he carried out, in cooperation with the U. S. Bureau of Mines, a laboratory research and plant development program which resulted in the development of a commercial process for making stable dolomitic refractories and dolomitic brick.

In 1926, Dr. Holmes was employed by the University of Missouri School of Mines and Metallurgy at Rolla, Mo., to establish and develop a Department of Ceramic Engineering. At the same time, he organized and directed the Missouri Clay Testing and Research Laboratories and was engaged in consulting work for several refractories and clay products companies. Numerous confidential reports were

Major Edward Holmes

prepared during this period. He continued in this capacity at Rolla, Mo., until 1932, when he was called to Alfred University to take charge of the New York State College of Ceramics.

At the New York State College of Ceramics, he directed an extensive program of reorganization and expansion of the work of the College into the field of technology and

engineering. In 1933, he organized the Ceramic Association of New York and since then he has served as its secretary-treasurer, as well as dean of the State College of Ceramics. With the help of the Ceramic Association of New York, in 1935 he established the New York Ceramic Experiment Station as a department of the College of Ceramics. In 1938, the students of Alfred University dedicated their annual publication, the *Kanakadill*, to him with a tribute to his accomplishments at that institution.

Dr. Holmes has been a member of The American Ceramic Society since 1921. He was elected to the Fellowship in 1931. From 1939 to 1942, he has served as a member of the Committee on Honorary Membership and in 1940 he was chairman of the Committee on Sections and Divisions. He helped to initiate and organize the Ceramic Educational Council and has served as chairman of its Curricula Committee and as its president in 1940–1941.

Dr. Holmes has rendered service as chairman of the Dry-Press Committee of the National Brick Manufacturers Association, which Committee produced a number of publications on the dry-press process. He has served as chairman of one of the Subcommittees on Lime of the A.S.T.M. and is now chairman of the Subcommittee on Nomenclature of the A.S.T.M. Committee on Refractories. He has been a member of the American Institute of Chemical Engineers, the Cosmos Club of Washington, D. C., and the Association of University Professors. He is active in Rotary, serving as president of the Wellsville, N. Y., Rotary Club in 1935–1936, and represented his club at the International Convention of Rotary at Mexico City in 1936. Dr. Holmes is now a member of the Institute of Ceramic Engineers, the American Society for Testing Materials, the Society for the Promotion of Engineering Education, the board of directors of the Ceramic Association of New York, and Sigma Xi, Alpha Chi Sigma, and Klan Alpine fraternities.

The following is a list of some of his work that has been published:

(1) (With A. W. Browne and J. S. King) "Electrolytic Nitridation of Various Anodes in a Solution of Ammonium Trinitride," *Jour. Amer. Chem. Soc.*, pp. 1769–76 (1919).
(2) "Lime in Chemical and Allied Industries," *Rock Prod.*, pp. 17–24 (1921).
(3) Outline of Uses of Lime. Lime Brief No. 25, National Lime Association.
(4) Outline of Process of Lime Manufacture. Lime Brief No. 250, National Lime Association.
(5) Distribution of Lime by Tonnage in the Chemical Industries. Lime Brief No. 252, National Lime Association.
(6) Use of Lime in Varnish Industry. Lime Brief No. 264, National Lime Association.
(7) "Outline of Uses of Lime," *Chem. & Met. Eng.*, **26,** 294–300 (1922).
(8) (With G. J. Fink) "Fundamental Physical and Chemical Properties of Commercial Lime: I, Available Lime Content," *ibid.*, **27,** 347–49 (1922); "II, Settling of Milk of Lime Suspensions," *ibid.*
(9) "Research Organization of the National Lime Association," *Bull. Amer. Ceram. Soc.*, **2** [5] 138 (1923).
(10) (With J. R. Withrow and H. K. Linzell) "Loss in Weight of Limestone as Function of Time and Temperature of Burning." Reprint published by the American Institute of Chemical Engineers, Dec. 6, 1926.
(11) (With G. A. Bole and W. J. McCaughey) "Dolomite Clinker as a Stable Basic Refractory," *Rock Prod.*, **32** [15] 59–67 (1929).
(12) (With A. J. Paul) "Effect of Various Addition Agents and Treatments on Green Strength of Missouri Refractory Clays," *Jour. Amer. Ceram. Soc.*, **12** [10] 676–86 (1929).
(13) (With A. J. Paul) "Physical Properties of Fineness Fractions of Slaked Semiflint Clay," *ibid.*, **13** [7] 447–53 (1930).
(14) (With C. M. Dodd, G. A. Page, and F. F. Netzeband) "Investigations of the Dry-Press Process," *Nat. Brick Mfgrs. Assn. Bull.*, No. 108 (Oct. 1, 1930).
(15) (With A. J. Paul) "Missouri Hard Flint Clay Firebrick," *Jour. Amer. Ceram. Soc.*, **14** [10] 755–63 (1931).
(16) (With C. M. Dodd) "Effect of Grog on Pressure Transmission in Dry Pressing," *ibid.*, [12] 899–905.
(17) (With W. D. Keller) "Estimation of Alumina Content of Diaspore and Burley Clay from Silica Content," *ibid.*, **15** [10] 68–71 (1932).
(18) "New York State College of Ceramics at Alfred University," *Bull. Amer. Ceram. Soc.*, **12** [7] 235–36 (1933).
(19) (With D. A. Dickens and S. S. Cole) "Variations in P.C.E. of Refractories after Heating at Elevated Temperatures," *ibid.*, **14** [4] 135–38 (1935).
(20) "Ceramic Art Education Problems in the Colleges," *ibid.*, **15** [1] 2–4 (1936).
(21) "Why Not 'Calcia?'" *ibid.*, [2] 53.
(22) "Present Status of Ceramic Engineering Curricula," *ibid.*, **17** [3] 135–41 (1938); other Committee reports published from time to time in *The Bulletin*.
(23) Editor of Works Manual published by the A. P. Green Fire Brick Co., Mexico, Mo.
(24) (With G. H. Strubler) Directory of Ceramic Industries of New York (a bulletin of the Ceramic Association of New York).
(25) "General Information on the Subject of Ceramics and the New York State College of Ceramics" (an Alfred University Bulletin).
(26) "Charles Fergus Binns" (address published in an Alfred University Bulletin).
(27) Catalogues of the New York State College of Ceramics.
(28) "Dedication Ceremonies of New Building of the New York State College of Ceramics" (a bulletin of the New York State College of Ceramics; Dr. Holmes contributed one article and edited the entire Bulletin).
(29) Numerous addresses for meetings in New York State.

Patents

(1) "Electric Battery Depolarizer," U. S. Pat. 1,259,099.
(2) "Flashlight Battery Rheostat," U. S. Pat. 1,264,520.
(3) "Electric Battery Depolarizer," U. S. Pat. 1,272,952.
(4) "Molybdates as Depolarizers," U. S. Pat. 1,281,372.
(5) (With G. J. Fink) "Production of Quick-Setting Lime Products by Addition of an Aluminum Fluoride," U. S. Pat. 1,554,183, Sept. 15, 1925.
(6) (With G. J. Fink) "Quick-Setting Lime Products," U. S. Pat. 1,554,184, 1925.
(7) (With G. J. Fink) "Quick-Setting Lime Products," U. S. Pat. 1,604,574, Oct. 26, 1926.
(8) (With G. J. Fink) "Production of Quick-Setting Lime Products by Addition of Carbonates," U. S. Pat. 1,604,575, Oct. 26, 1926.
(9) (With G. J. Fink) "Quick-Setting Lime Plaster," U. S. Pat. 1,604,576, 1926.

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Be a leader by securing the needed larger membership in
The American Ceramic Society, Inc.

Jacob Eugene Eagle, Trustee, Materials and Equipment Division

John Arthur Foster, Chairman, Art Division

Frederick Heath, Jr., Trustee, Structural Clay Products Division

Nelson Woodsworth Taylor, President, Ceramic Educational Council

(1942)

William Chittenden Taylor, Chairman, Glass Division

John Francis McMahon, Chairman, Materials and Equipment Division

J. F. SCHAIRER, AUTHOR OF "SYSTEM CaO–FeO–Al_2O_3–SiO_2, I" IN JUNE JOURNAL

When approached for material for a biographical sketch, Frank Schairer, physical chemist at the Geophysical Laboratory of the Carnegie Institution of Washington, Washington, D. C., made the following statement:

"As you probably know, my major interest has always been the application of physical chemistry to geological problems, particularly the problem of the origin of igneous rocks and their minerals. My attitude has always been that my major studies should be on rock-forming minerals and that I should confine my attention to systems of direct or very close interest in solving mineralogical or geological problems. If these studies had ceramic, metallurgical, or other scientific interest it was all to the good, but I have never instituted any research project because it was of especial interest to ceramics or metallurgy. Thus I do not wish to pose as a bona fide ceramist, although I have always had a kindly and sympathetic interest in problems in the general chemistry of ceramics."

"Bona fide ceramist" or not, we wish to salute Dr. Schairer for the contributions he has made to ceramics through his extensive researches on the phase equilibria relations in the anhydrous silicate systems, the chemical composition and mutual melting relations of rock-forming minerals, particularly olivines, pyroxenes, pyroxenoids, melilites, and feldspars, the origin of igneous rocks, and the crystallization processes in molten silicate solutions.

Biography

Dr. Schairer was born in Rochester, N. Y., April 13, 1904. He attended Yale University, New Haven, Conn., where he received his B.S. degree in chemistry in 1925, his M.S. degree in geology in 1926, and the Ph.D. degree in chemistry in 1928. From 1925 to 1927, he was an assistant in chemistry at the same university. He became associated with the Geophysical Laboratory in 1927.

Dr. Schairer is a Fellow of the Mineralogical Society of America and the Geological Society of America and a member of the American Chemical Society, Sigma Xi, Alpha Chi Sigma, and Gamma Alpha.

Publications

Much of Dr. Schairer's published work has been done in collaboration with N. L. Bowen, a former member of the Geophysical Laboratory staff and at present professor of geology at the University of Chicago, Chicago, Ill.

"Study of the Brown Feldspar from Portland, Conn.," *Proc. Yale Mineralog. Soc.*, **2** (1924–25), p. 20.

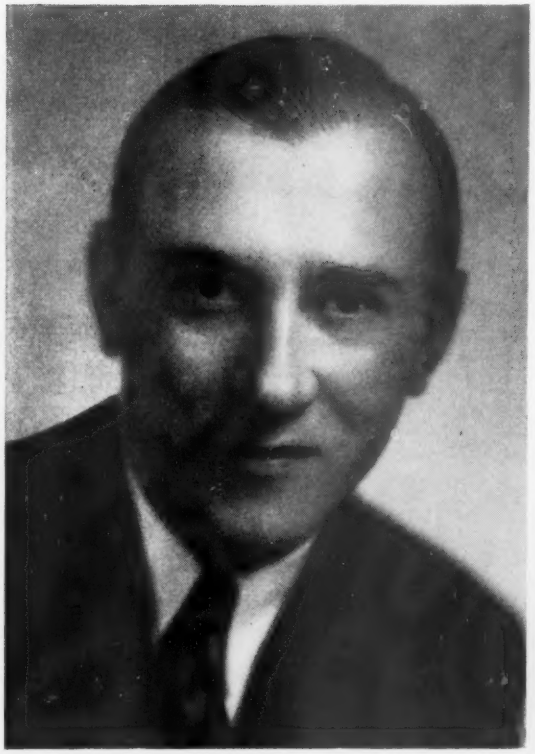
"Copiapite from the Santa Maria Mountains, Eastern Riverside County, Calif.," *Amer. Mineralogist*, **9**, 242–45 (1924).

(With C. C. Lawson), "Pickeringite from Portland, Conn.," *Amer. Jour. Sci.*, **11**, 301–304 (1926).

"Lithophilite and Other Rare Phosphates from Portland, Conn.," *Amer. Mineralogist*, **11**, 101–104 (1926).

(With N. L. Bowen), "The System Leucite–Diopside," *Amer. Jour. Sci.*, **18**, 301–12 (1929).

(With N. L. Bowen), "Fusion Relations of Acmite," *ibid.*, pp. 365–74.



J. F. Schairer

(With H. W. Foote), "The System Na_2SO_4–NaF–NaCl–H_2O: I, The Ternary Systems with Water and Two Salts; II, The Quaternary System at 25° and 35°," *Jour. Amer. Chem. Soc.*, **52,** 4202–4209, 4210–17 (1930).

(With N. L. Bowen and H. W. V. Willems), "The Ternary System Na_2SiO_3–Fe_2O_3–SiO_2," *Amer. Jour. Sci.*, **20,** 405–55 (1930).

"Minerals of Connecticut," *Conn. State Geol. and Nat. History Survey Bull.*, No. 51, 121 pp. (1931).

(With N. L. Bowen), "The System FeO–SiO_2," *Amer. Jour. Sci.*, **24,** 177–213 (1932).

(With N. L. Bowen and E. Posnjak), "The System Ca_2SiO_4–Fe_2SiO_4," *ibid.*, **25,** 273–97 (1933).

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A. I. ANDREWS NAMED HEAD OF DEPARTMENT OF CERAMIC ENGINEERING AT UNIVERSITY OF ILLINOIS

Andrew I. Andrews, professor in the Department of Ceramic Engineering at the University of Illinois, Urbana, Ill., has been appointed head of the Department to succeed C. W. Parmelee, who has retired.

A. I. Andrews

Dr. Andrews received his B.S. degree in chemistry in 1920 and his M.S. degree in 1921 from the University of Wisconsin.

After receiving his Ph.D. degree in industrial chemistry at Ohio State University, Columbus, Ohio, in 1924, Dr. Andrews became professor of ceramic engineering at Alfred University, Alfred, N. Y. In September, 1925, he accepted a position as assistant professor of ceramic engineering at the University of Illinois. He became associate professor of ceramic engineering at the same University in 1928 and professor of ceramic engineering in 1933.

During his years of teaching, Dr. Andrews has also served as research consultant for the Dolomite Products Company, the A. O. Smith Corporation, the Titanium Alloy Manufacturing Company, and for the R. & H. Chemicals Department of the E. I. du Pont de Nemours & Co., Inc.

Dr. Andrews is also the author or co-author of many publications dealing with the various phases of enameling.

American Ceramic Society Activities

Dr. Andrews became a member of The American Ceramic Society in 1924, and in 1933 served as Chairman of the Enamel Division. He also served as vice-president of The Society in 1938–1939 and as president in 1939–1940. At the present time, he is chairman of the Committee on Sections and Divisions and is serving on the Advisory Board for Cooperation with the U. S. Government.

For a more extended biographical sketch of Dr. Andrews, see the February, 1938, *Bulletin*, pp. 69–70.

Hobart McKinley Kraner, President, Institute of Ceramic Engineers

Charles Mitchener Dodd, Secretary, Ceramic Educational Council

Frederick Curtis Henderson, Chairman, White Wares Division

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NECROLOGY

HARRY LEE KING

Harry Lee King, vice-president and sales manager of the Federal Seaboard Terra Cotta Corporation, 10 East 40th St., New York, N. Y., died on March 12, 1942. His death was caused by a cerebral hemorrhage.

Mr. King was born May 3, 1882, on Staten Island, where his father was a physician and surgeon in the Marine Hospital.

Mr. King started his career in the terra-cotta industry in 1900 by becoming assistant to Thomas Van Every, manager of the National Terra Cotta Association. He later became assistant to DeForest Grant, president of the old Atlantic Terra Cotta Company.

When Mr. Grant founded the Federal Terra Cotta Company in 1910, Mr. King became vice-president and sales manager. He continued in that capacity until 1928, when the New Jersey Terra Cotta Company, the Federal Terra Cotta Company, and the South Amboy Terra Cotta Company merged under the name of the Federal Seaboard Terra Cotta Corporation. Mr. King was elected vice-president and sales manager and held this position until his death.

At one time Deputy Commissioner of the Boy Scouts of America, Mr. King was active in various boys' clubs in New York City. He also served as vestryman and warden of Christ Protestant Episcopal Church.

He is survived by his widow, Cornelia Neilson King.

JAMES SIMPSON

James Simpson, founder of the Abingdon Sanitary Mfg. Co., Abingdon, Ill., died on November 26, 1941, at his home in Los Angeles, Calif.

Born in Scotland in 1866, Mr. Simpson worked as a boy with his father at Johnson's Pottery near Glasgow.

In 1866, at the age of twenty, he came to the United States and obtained his first job at the plant of the Enterprise Pottery in Trenton, N. J. During the next fifteen years, he worked at several of the potteries along the eastern seaboard. While working at the Crescent Pottery, Trenton, N. J., he made the first successful siphon jet closet bowl.

James Simpson

In 1903, the Universal Sanitary Mfg. Co., New Castle, Pa., was organized by local business men, who employed Mr. Simpson to build the factory and to become its general manager. At this time, domestic sanitary pottery was still made by pressing; in England, however, the casting method was being developed. Mr. Simpson, seeing the great advantage of this new process, began working on it about 1907 with Mr. Bolton, an Englishman. He made such progress with this new process that, in 1908, he planned and built the plant of the Abingdon Sanitary Mfg. Company at Abingdon, Ill. This plant, designed to produce pottery by the casting process, became the first American pottery to do this successfully.

In 1922, Mr. Simpson also designed and built the pottery of the Eljer-California Co., Los Angeles, Calif., of which Company he became vice-president.

Remaining in Abingdon, Mr. Simpson served as president and general manager of the Abingdon Sanitary Mfg. Company until his retirement in 1932, at which time he moved to California.

GEORGE C. THOMPSON

George Cassius Thompson, retired pottery manufacturer of East Liverpool, Ohio, and a descendant of one of East Liverpool's pioneers, died of a heart attack on February 25, 1942, at his winter home in Mt. Dora, Fla.

Mr. Thompson, who was seventy-two years old, had been in poor health since 1932, when he suffered a stroke which left him partially paralyzed.

The Thompson family has been associated with East Liverpool since the days when the community was known as Fawcettstown. William Thompson, great-grandfather of George Thompson, settled in the community in 1818 and conducted a hotel and hattery in Calcutta during the stagecoach days. One of his sons, Josiah Thompson, became a pioneer merchant and conducted the largest stores in the village for many years.

George Thompson was a son of Cassius C. Thompson, who founded the Thompson Pottery in 1869. A short time later, Josiah Thompson entered the business with his son.

George C. Thompson

George Thompson became associated with his father's Pottery when he was about fifteen years old. When he was sixteen, he became a salesman. He took time off, however, to attend Wooster College, Wooster, Ohio.

The C. C. Thompson Pottery Company, incorporated in 1889, manufactured both white and yellowware. Although yellowware manufacture was abandoned by most of the district manufacturers before the turn of the century, the Thompson Pottery continued to make yellowware and semiporcelain for many years.

Following the death of Cassius Thompson, the Pottery was operated by his heirs, George C., Dale D., and Minnie Thompson Moore. George C. Thompson became president of the Pottery following the death of his father.

Active in civic affairs, Mr. Thompson served many years as a member and as president of the East Liverpool Board of Education and as a member of the Sinking Fund Commission.

Mr. Thompson was also active in the affairs of the United States Potters Association, serving as president in 1908, as a member of the executive board from 1904 to 1939, and as chairman from 1931 to 1936. He was also a member of the Labor Committee for twenty years.

Mr. Thompson had been a member of The American Ceramic Society.

(1942)

UNIVERSITY OF NORTH CAROLINA

Student Branch

The Student Branch of the University of North Carolina has elected the following officers for 1942–1943: Addison Hawley, Jr., Goldsboro, N. C., *President;* James E. Partlow, Olive Hill, Ky., *Vice-President;* R. Jack Smith, Jr., Goldsboro, N. C., *Secretary;* Dick Dammann, Amityville, N. Y., *Treasurer;* C. M. Steele, Statesville, N. C., *Junior Member on Engineer's Council;* and Frank A. Rugh, Jr., Jeannette, Pa., *Alternate.*

B. E. Paschal, R. B. Adair, and C. V. Rue have been named on the committee to prepare for the Annual Engineer's Brawl. The president also has appointed R. B. Bickerstaff, P. P. Turner, and H. L. Miller to plan the spring entertainment features, including a dance.

Keramos

M. Hershel Emison, an outstanding student in the Ceramic Department at the University of Alabama, has been elected a nonresident active member of the North Carolina Chapter of Keramos. He is the first student in the Department to be so honored.

NEW YORK STATE COLLEGE OF CERAMICS

Student Branch Meetings

Louis J. Trostel, newly elected president of The American Ceramic Society and chief chemist of the General Refractories Co., Baltimore, Md., spoke on "Magnesite and Chrome Refractories" at the Student Branch meeting held in March. Mr. Trostel's talk was illustrated with slides and was followed by an open discussion. Approximately 125 persons were in attendance.

Service keys were awarded to the officers and executive staff of the *Alfred Engineer,* the latest issue of which was published April 19.

J. T. Robeson, chief engineer of the Allied Engineering Co., Cleveland, Ohio, spoke on "Kiln Design" at the meeting of the Student Branch held on April 14.

John S. Angevine, the representative from the New York State College of Ceramics, won first prize in the Student Speaking Contest held at the Annual Meeting of The American Ceramic Society in Cincinnati, Ohio (a photo of Mr. Angevine appears on the opposite page).

St. Pat's Festival

The senior ceramic engineers successfully managed the annual St. Pat's Festival held on March 19 and 20. High lights of the Festival were (1) the New York State College of Ceramics openhouse, at which many commercial products as well as the work of the College were displayed; (2) a tea dance; and (3) a formal ball, at which the queen of the ball, Miss Betty Stangl, was crowned. Music for the ball was furnished by Bob Chester's Orchestra. George W. Kellogg, as St. Pat, presided over the activities.

Keramos

John G. Mohr and Eric Falcão, both special students, were initiated at a recent meeting of Keramos. Following the initiation ceremonies, Burton Baker and David Armant gave brief talks concerning their summer work.

A special meeting of Keramos was held on May 3 to elect officers for 1942–1943. The annual banquet of Keramos was held on May 14.

Two motion pictures, "The Most Modern Firebrick Plant in the World" and "Some Modern Applications of Refractories," sponsored by Keramos for the ceramic students, were presented on April 9 by K. J. Denton and other representatives of the A. P. Green Fire Brick Co., Mexico, Mo. An open discussion followed the showing of the pictures, and souvenirs and literature were distributed.

—Lawrence Bickford, *Corresponding Secretary*

OHIO STATE UNIVERSITY

The last meeting of the winter quarter of the Ohio State University Student Branch was held in Lord Hall on March 18.

Members of the Ohio State Student Branch of the A.I.M M.E. were guests and took part in a round-table discussion on "Refractories."

—D E. Holmgren, *Corresponding Secretary*

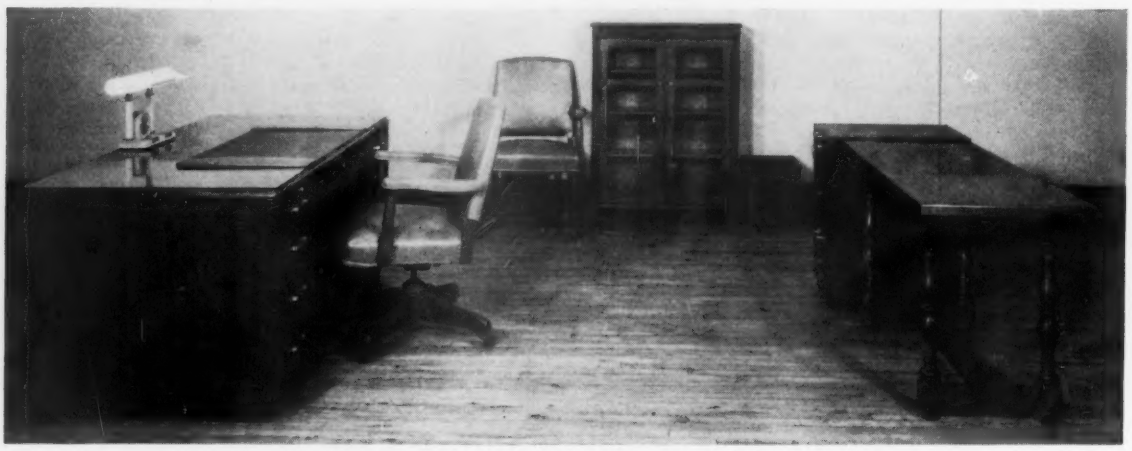
MISSOURI SCHOOL OF MINES AND METALLURGY

At a meeting of the Student Branch at the Missouri School of Mines and Metallurgy, Rolla, Mo., on April 15, William Smothers gave a talk on "The Drop Mercury Method of Analysis of Sodium and Potassium in Silicates." This new method is used in the quantitative analysis of these materials.

The Student Branch is making plans for the publication of a periodical which will be written by the students of the Ceramic Engineering Department.

The Spring Outing of the Student Branch was held on April 23.

—Paul G. Herold, *Head, Ceramic Engineering Department*



Testimonial to Arthur Simeon Watts
By His Former Students
Office Furniture and Permanent Endowment Fund
Illuminated Book of Testimonial Letters
April 22, 1942, Cincinnati, Ohio

NOTES AND NEWS FROM FORTY-FOURTH ANNUAL MEETING

CERAMIC CAMERA CLUB

Between 1500 and 2000 persons visited the Fourth Annual Salon of the Ceramic Camera Club held in the Netherland Plaza during the Forty-Fourth Annual Meeting of The American Ceramic Society to see the many excellent photographs on display. Winners of the keen competition for awards are announced as follows:

WINNERS OF AWARDS

Classification	Exhibitor	Print Title
FRAZIER AWARD	F. G. Schwalbe	"Columbine"
PORTRAIT		
First	J. Earl Frazier	"You Started Me Thinking"
Honorable Mention	R. W. Knauft	"Barbara"
PICTORIAL		
First	Rolland Roup	"Sunday Hikers"
Honorable Mention	E. L. Hettinger	"Breakers"
INDUSTRIAL		
First	R. W. Knauft	"Oh! Say Can You See"
Honorable Mention	J. Earl Frazier	"Goal Ahead"
TRADE PAPER		
First	Frederick Heath, Jr.	"Security"
Honorable Mention	E. L. Hettinger	"57 Varieties"
SCIENTIFIC		
First	G. M. Ehlers	"NH_4Cl"
Honorable Mention	Frederick Heath, Jr.	"What Causes Efflorescence?"
ACTION		
First	Rolland Roup	"Back Dive"
Honorable Mention	Frederick Heath, Jr.	"Whee!"

Board of Control for 1942–1943

President: H. M. KRANER, Bethlehem Steel Co., Bethlehem, Pa.; *Secretary-Treasurer:* V. H. REMINGTON, B. F. Drakenfeld & Co., Washington, Pa.; J. EARL FRAZIER, Frazier-Simplex, Inc., Washington, Pa.; ROLLAND ROUP, Globe-Union, Inc., Milwaukee, Wis.; and R. W KNAUFT, Charles Taylor Sons Co., Cincinnati, Ohio.

New Members Wanted!

Any member of The American Ceramic Society is eligible to become a member of the Ceramic Camera Club. The annual dues are $3.00. Anyone interested should send his check to Victor H. Remington in care of the B. F. Drakenfeld & Co., Washington, Pa.

KERAMOS OFFICERS FOR 1942-1944

The following officers were elected for 1942–1944 at the biennial convocation of Keramos held at the Netherland Plaza, Cincinnati, Ohio, April 19 to 23, 1942:

Grand President: C. M. DODD, Dept. of Ceramic Engineering, Iowa State College, Ames, Iowa.
Grand Vice-President: A. I. ANDREWS, Dept. of Ceramic Engineering, Univ. of Illinois, Urbana, Ill.
Grand Secretary: LANE MITCHELL, Dept. of Ceramic Engineering, Georgia School of Technology, Atlanta, Ga.
Grand Treasurer: S. R. SCHOLES, New York State College of Ceramics, Alfred, N. Y.
Grand Herald: A. F. GREAVES-WALKER, Dept. of Ceramic Engineering, Univ. of North Carolina, Raleigh, N. C.

Annual Meeting Attendance

Men	733
Students	99
Ladies	85
Total	917

STUDENT SPEAKING CONTEST WINNERS

First Prize: JOHN S. ANGEVINE, New York State College of Ceramics, Alfred, N. Y.
Second Prize: ROBERT L. GROVE, Univ. of Illinois, Urbana, Ill.
Third Prize: A. B. JOHNSON, Georgia School of Technology, Atlanta, Ga.
Fourth Prize: CHARLES L. MELOY, Pennsylvania State College, State College, Pa.

John S. Angevine

FELLOWS OF THE AMERICAN CERAMIC SOCIETY ELECTED IN 1942

GEORGE HENRY SPENCER-STRONG, Porcelain Enamel & Manufacturing Company, Baltimore, Md.
CHARLES HENRY COMMONS, JR., Carborundum Company, Niagara Falls, N. Y.
JAMES BAILEY, Hartford-Empire Company, West Hartford, Conn.
MYRIL CLEMENT SHAW, Edward Orton, Jr., Ceramic Foundation, Columbus, Ohio.
GEORGE JOSHUA BAIR, Mellon Institute, Pittsburgh, Pa.

CHARLES LADD NORTON, JR., Babcock & Wilcox Company, New York, N. Y.
WILLIAM HORAK, Hartford-Empire Company, Hartford, Conn.
HUGO FILIPPI, Illinois Brick Company, Chicago, Ill.
PAUL GEORGE HEROLD, Missouri School of Mines and Metallurgy, Rolla, Mo.
JOHN RICHARD KAUFFMAN, Allied Engineering Company, 29 Highland Drive, Milltown, N. J.
JOHN HENRY KOENIG, Hall China Company, East Liverpool, Ohio.
CHARLES JACOB KOENIG, Engineering Experiment Station, Ohio State University, Columbus, Ohio.
HOWARD RUSSEL LILLIE, Corning Glass Works, Corning, N. Y.
CAMERON GERALD HARMAN, Department of Ceramic Engineering, University of Illinois, Urbana, Ill.
JAMES DALE TETRICK, R. & H. Chemicals Department, E. I. du Pont de Nemours & Co., Inc., Perth Amboy, N. J.

PROFESSORS HONORED

ARTHUR SIMEON WATTS

The former students of Arthur Simeon Watts, chairman and professor of the Department of Ceramic Engineering, Ohio State University, Columbus, Ohio, honored him at the Ohio State Alumni dinner held on April 22 at the Metropole Hotel, Cincinnati, Ohio, during the Annual Meeting of The American Ceramic Society.

The establishment of the Arthur Simeon Watts Fund was announced at the dinner. This fund, when completed, will be used as a scholarship or loan fund for students in the Department of Ceramic Engineering at Ohio State University. A sum of $1400 has been collected to date for the fund.

Acting in behalf of Perry D. Helser, Washington, D. C., chairman of the Committee on Arrangements, J. L. Carruthers, of the Department of Ceramic Engineering, presented to Professor Watts a leather-bound book, containing letters of greetings, congratulations, and appreciation from more than two hundred of his former students, and a complete new set of walnut furniture for his office in Lord Hall (for photo of furniture, see page 72, this issue).

Approximately one hundred Ohio State alumni attended the dinner. Dean C. E. MacQuigg of the College of Engineering and Oscar Thomas of the Ohio State University Development Fund spoke on the program. Mr. Thomas showed motion pictures of the 1941 Ohio State-Michigan football game.

Ceramic Activities

Professor Watts is a Fellow and former President of The American Ceramic Society, former Dean of the Fellows of The Society, and a member of the Institute of Ceramic Engineers, the Ceramic Educational Council, the British Ceramic Society, and the Society for the Promotion of Engineering Education.

He is the author of over seventy articles published in *The Bulletin* and in the *Journal of The American Ceramic Society* and in other publications; he is one of the outstanding authorities of the United States on porcelains and ceramic bodies and glazes; and he has contributed much to the development of American ceramic industries.

CULLEN WARNER PARMELEE

Because of his long service in ceramics, his valuable contributions, his leadership in ceramic education at Rutgers University and at the University of Illinois for a period of thirty-nine years, and his leadership in The American Ceramic Society, Cullen Warner Parmelee has been elected Life Member of this Society. The Life Membership Certificate was presented to Dr. Parmelee by the Board of Trustees at its annual business meeting held on Monday morning, April 20, in Cincinnati, Ohio.

In addition to the Life Membership, the alumni of the University of Illinois, at [illegible] dinner meeting held in Cincinnati on April 22, pre[illegible]ed Dr. Parmelee with a beautifully bound book of l[illegible]n the several alumni. The binding of the book wa[illegible]one by the official binder for Mellon Institute in Pittsburgh. The alumni also have provided a plaque to be placed in the Ceramic Building as a testimonial to Dr. Parmelee and have raised a considerable sum of money which is to be used in financing the Cullen Warner Parmelee Fellowship.

Ceramic Activities

Dr. Parmelee in past years has served as president of The Society, as Dean of the Fellows, and as president of the Ceramic Educational Council. He is also the author of more than one hundred technical and scientific articles, most of which have appeared in the publications of The Society.

HAROLD S. NASH

SPARK PLUG OF ART DIVISION

Serving as chairman of the Papers and Program Committee of the Art Division (and as a member of the Cincinnati Local Committee), Harold S. Nash, of the University of Cincinnati, was in a large part responsible for the outstanding success of the program of the Art Division at the Annual Meeting. Members of the Art Division will be glad to know that Mr. Nash has been re-appointed chairman of this same Committee and will continue his good work through the coming year.

WAR EMERGENCY

Calcium Carbonate

Although the war has restricted the importation of whiting, a fine-grained preparation of calcium carbonate used as a filler in the manufacture of rubber, the United States has large deposits of white limestone and marble which should produce enough whiting for domestic needs.

A report issued by the U. S. Bureau of Mines shows that whiting for the rubber industry is produced in California, Georgia, Illinois, Iowa, Missouri, and Pennsylvania.

Whiting is also obtained by grinding or pulverizing chalk and dolomite and by a chemical process in which pure lime is treated with carbon dioxide.

In 1931, the Bureau of Mines began a study of the preparation of whiting from raw materials in the United States to encourage the domestic industry. A report on that research was published in 1937. In the latest report, "Chalk and Whiting," Information Circular 7197, by Oliver Bowles, the different classes of whiting and their wide uses and the processes of manufacture and areas where the most important sources of raw material are located are described.

Large quantities of whiting are used by the paint industry, but the material also plays important roles in the manufacture of many other products, such as glazes and enamels for ceramic products, putty, paper, white ink, shoe dressing, soap, cosmetics, crayons, tooth powder and tooth paste, medicines, linoleum, gypsum plaster, paper plastics, cigarette paper, roofing cement, sealing wax, acoustic tile, dolls, and fireworks.

A copy of this report may be obtained by writing to the U. S. Bureau of Mines, Department of the Interior, Washington, D. C.

GLASS FIBER TAPE IMPROVES BLOOD PLASMA TRANSFUSION APPARATUS

The glass industry has made an important contribution to military medicine through its development of a new glass fiber filter which has improved the performance of the apparatus used to give the blood plasma transfusions which are expected to save the lives of many soldiers who in past wars would inevitably have died from shock following their wounds.

The filter, a short strip of tape woven of soft, flexible glass fibers and inserted into the flexible tubing of the apparatus, strains out of the blood plasma any foreign particles which might get into it and which, if they entered the blood stream, might cause serious complications.

FURTHER RISE BOOSTS KAOLIN SHIPMENTS ABOVE MILLION TONS IN 1941*

For three straight years, production of a high-grade clay in the United States has made new records. In 1941, sales of domestic kaolin or china clay jumped to 1,087,848 short tons valued at $9,205,892 compared with 833,450 tons valued at $6,994,106 in 1940. The tonnage topped that of 1940 by 31% and was more than double that of 1929. The paper industry alone required 110,000 tons more than in 1940 and consumed 56% of the total shipments. The country needs more and more paper, larger proportions of clay are used in making high-grade paper, and domestic clay is being used instead of imported clay both as filler and coating. Percentage-wise, the consumption of clay for refractories, pottery, rubber, paint, and certain minor uses increased even more than shipments of paper clay.

Imported clay, almost all English, which is used chiefly in paper, sanitary ware, and pottery and to a diminishing extent in porcelain and tile, amounted to only 66,935 short tons with a foreign market of $698,502 for the first nine months of 1941. Import statistics for the last quarter cannot be published, but the total for 1941 was undoubtedly less than the 105,566 tons imported in 1940. Average figures for the period 1925–1929 show imports of 339,014 tons and domestic shipments of only 453,618 tons a year; during the period 1909–1913, the ratio of imports to domestic shipments was nearly 2 to 1 (261,266 and 132,114 tons a year, respectively).

In 1941, Georgia as usual was the leading kaolin mining state, producing 787,013 tons or 72% of the national total output. South Carolina, with 177,276 tons or 16% of the total, ranked second, and Pennsylvania, with 44,277 tons or 4%, ranked third. Other producing states were, in order of output, Florida, California, North Carolina, Virginia, Delaware, Illinois, Alabama, Maryland, Vermont, Utah, and Tennessee.

Nine firms, operating fourteen mines and each producing 30,000 tons or more of kaolin, furnished 80% of the total quantity and 84% of the value of the 1941 sales. Approximately the same percentages of total quantity and value of the smaller shipments in 1940 came from ten firms operating fifteen mines. More than one half of the number of firms reporting production in 1941 produced less than 4000 tons each, and their aggregate contribution represented only 3% of the total tonnage shipped. The total output of the forty-two smallest firms was less than that of any one of the three largest firms in 1941.

Price quotations for domestic clays have remained virtually unchanged for several years, and readjustments of English clay prices have largely reflected changes in ocean freight and insurance. Availability of bottoms was indicated by a reduction of $1 a long ton in the freight rate in the summer of 1941. The gradual increase in the average value of domestic sales from $7.94 in 1939 to $8.28 in 1940 and $8.46 in 1941 reflects a larger proportion of the higher-grade clays rather than a general rise in prices.

The following table presents the production and value of kaolin by states for 1939–1941.

* Mineral Market Report prepared by A. Linn under the supervision of P. M. Tyler, Chief, Nonmetal Economics Division, Economics and Statistics Branch, U. S. Bureau of Mines.

	1939		1940		1941	
State	Short tons	Value	Short tons	Value	Short tons	Value
California	19,481	$111,719	14,407	$118,481	20,810	$164,110
Georgia	512,214	4,135,727	570,010	4,834,826	787,013	6,573,605
North Carolina	11,308	165,896	14,602	202,642		
Pennsylvania	49,657	164,562	49,541	169,981	44,277	172,783
South Carolina	158,629	1,297,813	152,227	1,302,812	177,276	1,596,471
Undistributed	29,515*	324,889*	32,663†	365,364†	58,472‡	698,923‡
	780,804	$6,200,606	833,450	$6,994,106	1,087,848	$9,205,892

* Includes Alabama, Delaware, Florida, Maryland, Tennessee, Utah, Vermont, Virginia, and Washington.
† Includes all states listed in star footnote except Washington.
‡ Includes states listed in star footnote minus Washington and plus Illinois and North Carolina.

DEVELOPMENT OF AN ART PROGRAM AT AN NYA RESIDENT PROJECT*

By Jack M. Smoot

Abstract

The problems encountered in developing a program for unemployed youths are presented. The use of material at hand, the development of latent artistic ability, and the practical application of training in the art of pottery make this project worth while.

I. Introduction

In 1938, Dillard B. Lasseter, then director of the National Youth Administration for Georgia, conceived the idea of establishing a ceramic division to provide that type of work experience for the youth of Georgia. Mr. Lasseter further desired to know what basic work experience would be needed to present a background of sound work habits and how to discover the aptitudes of the young people for these different jobs.

The late A. V. Henry, Director of the Ceramic Department at the Georgia School of Technology, acted in an advisory capacity, and through him ideas began to crystallize. It was decided that a program dealing with the production of artware and chinaware presented the best opportunity for Georgia youth.

(1) Project Location

Should this project be located where youth had a background of handicrafts, in a large city where the background was industrial, or in the proximity of the clay deposits? Further discussions were as follows: (1) what approach should be used; (2) should industrial pottery machinery be installed; or (3) would it be advisable to offer work experience fitting the youth to set up small art potteries?

The establishment in Georgia of two potteries materially influenced the decision. It was decided that both types of experience should be provided. The potteries promised to employ workers from these projects, provided the work experience would fit them to perform a definite job. It seemed practical, moreover, to give youths experience in the manipulation of the potter's wheel and in the setup of a small art pottery. Georgia is an agricultural state, and much of the available work for young people is of a seasonal nature. An industrious person could supplement a meager income by making and selling art pottery during the off season of his employment.

The shop was placed at the Habersham Resident Project, which is two miles west of Clarkesville, Georgia, in the foothills of the Blue Ridge Mountains. This particular project was chosen because the youth constituency was both rural and urban.

Lambert A. Meaders was employed to take charge of the art pottery work. The Meaders family has always been a pottery family. Their Welsh forefathers brought the trade with them when they migrated to this country. Mr. Meader's father[1] was an interesting character with such an honesty of purpose that he always maintained a high standard of workmanship at his small mountain pottery.

II. Work Program

On all NYA projects, each youth works from 120 to 160 hours every month and is allowed to spend the remainder of the time in guidance forums pertaining to the type of work in which he is interested. As it was first necessary to construct the building for the shop, many of the boys became interested in ceramics while working on this building or while installing the machinery. Their questions were interesting. Very few of them had ever seen a piece of pottery made. The machinery and equipment was strange to them, and they continually asked questions about plans. The first group of workers was, therefore, recruited chiefly from these boys.

(1) Selection of NYA Youths

All youths must be between the ages of 16 and 24. The 16-year old youth, to be eligible, must have been out of school at least six months. This limitation discourages any boy or girl from quitting his regular school work, and only those young people who are already out of school, are unemployed, and are unable to furnish themselves with an education can participate. The Student Aid Division of the NYA was established for the purpose of helping a youth remain in school.

None of the first group to register in the ceramic shop had seen pottery made. Two boys had seen a pug mill, a foot-powered potter's wheel, and a ground-hog kiln. Two of the boys had never been out of northeast Georgia and had not seen a streetcar, a radio, or electric lights. Quite different from the background of these workers was that of one young man who had lived in a number of different states and had experienced every convenience of modern-day living. He had a natural background for fertile imagination and showed a great deal of ingenuity. One of the young ladies was from a rather prominent family in the State, being a niece of a former comptroller general of the United States. She was a high-school graduate but was unable to attend college. Six of the group were below the 5th-grade level, four had received high-school diplomas, and the remainder had from 6 to 10 years of formal education.

The youth were separated into two divisions: the nonhigh group, who had not completed high school, and the high group, who had a high-school education. Both groups were divided into major and minor shifts.

* Received August 25, 1941.

[1] A. H. Eaton, Handicrafts of the Southern Highlands, p. 212 and photograph, p. 142. Russell Sage Foundation, New York, 1937. 355 pp.

Those majoring in ceramics were interested in gaining enough experience to follow the work as their vocation. Those taking the minor ceramics were persons interested in ceramics but majoring in some other shop.

(2) Instruction Notes

Most ceramic books are too technical for these youths. It was necessary, therefore, to compose a set of notes. They were prepared in separate sections, and as each worker mastered one section, he was given a new one. The logic of this plan was that the same type of information could not be given to every youth, for some were not educationally prepared to master all parts of the program and they were carried only so far as they were prepared to go, which in turn limited the type of job they would be eligible to hold. Many abstracts from books and magazines were used as supplementary information and the workers were encouraged to obtain catalogues, which many times gave a better description of what they needed to know than the notes provided for them.

(3) Art Program Necessary

After the first kiln of pottery was fired off in the month of February, 1939, it was decided that little would be accomplished until an art program was developed. It would be of small value to the workers if they learned only the manipulation of the equipment and had no idea of the artistic value of the work they were performing.

Louis Block, art consultant for all NYA work, came to Habersham to start the art program. He gave all persons pencils, paints, and paper and directed them to begin designing anything that they chose to do. They were allowed a free hand and were given no instruction in color, proportion, or design; no one was to prejudice the youth in any way, and they were to do their own work.

A young lady who had received her art training at Sophie Newcomb College was placed in charge of this group, and for three months this program was followed.

This plan of development is practiced in many public schools where a young child is quite easily charmed with colors and likes to draw the things which his small mind imagines. Young men and women, however, who had reached 18 years of age, found it difficult to become interested in this sort of work, and at the end of three months openly rebelled at the thought of attending this period. It became evident that this system was not working.

Before formulating new plans, the young people were asked to give their reactions to the art program. Five opinions were given, namely, (1) they could not draw; (2) they were not interested in trying to draw; (3) they felt that they were wasting their time; (4) they wanted to spend all of their time in the ceramic department doing other work; and (5) they could see no practical application in what they were doing. It was evident that the actual construction of ceramic ware was being presented in an interesting manner but that the plan had definitely failed to interest the workers in the artistic aspects of this work.

The youth seemed to lack two things, namely, an idea for a design and the ability to make a sketch when conceived. The three months had a devastating effect on their self-confidence, and it was necessary to overcome this limitation. Some simple vase designs were given to them to copy as pencil drawings. The scratch system of drawing was explained, and they were acquainted with the use of guide ordinates. All of the designs were plain and objects were chosen which would show rhythm of line and placement of mass in such a way as to make them effective factors in the design. Outline work was thus stressed until everyone gained some confidence in his ability to draw. Until this point, although they had learned to execute a line form, nothing original had been required of them. The new workers who had not been in the first art group progressed much faster and showed more interest in the work.

The first objective having been accomplished, the youth was led into the unexplored field of creating designs never before seen by him. As a basis for this work, the varied color schemes in floral elements and the majestic structural features of objects in nature were pointed out to him. Examples of simplifying these shapes into abstract designs were illustrated, and then he was allowed to work independently.

The results were gratifying. One boy took an old bone and from it designed a beautiful handle for a vase. One youth took the pose of a human figure and worked it into a vase while another modeled a vase from the form of a squatting rabbit. As problems arose, the foreman gave illustrated chalk talks and any complicated composition was broken down into the simplest form. These talks were in the form of open discussions, and often a design was the composite idea of the whole group.

As there is no regular enrollment time at these work projects, a cross section of the entire program is evident at all times. This is both an advantage and a disadvantage. As a worker advances, he is able to absorb much from the advice given to other workers. This system has created much more interest, for the youths look forward to the time allotted in the art shop and never complain of the waste of time devoted to art development.

At various times, inspection trips to potteries are made, and there the youth sees the manufacturing process and has a chance to inspect the pottery. Since the art course has been instituted, it is interesting to note the critical attention given to color and shape of each piece of ware that comes to their attention. It is also amusing to watch them pick up china at a restaurant and look it over as carefully as a manufacturer would his competitor's product.

The primary forces entering into the design of mass-produced articles are technique of production, economy of operation, and consumer acceptance. In reality, this last factor entirely eliminates the first two, for if the articles produced had no consumer acceptance, the ware would not be produced at all. To analyze the statement further, three factors which regulate consumer acceptance are utility, price, and eye appeal.

Of these three real factors, the ceramic artist or designer can totally control only one, eye appeal. He can, however, greatly increase the utilitarian value of the ceramic ware. To be successful in this work, a knowledge of the technical problems encountered in the manufacture of the ware must be presented as well as a clear understanding of the limitations to which it will be subjected in use. When this is learned, good designs can be created.

The art program is now a reality in all of the Georgia NYA ceramic shops. Like Topsy, "it just growed" until the full value of a workman who knows and enjoys the significance of good work has been achieved.

The goal of the NYA is to present a type of productive work experience to the youth of this land so that they will become efficient workmen with good work habits. The experimentation with art or the application of art to fit their specific needs has definitely improved the traits to be instilled in these NYA workers.

Plans have been made to strengthen the art program during the coming year. A supervisor, who has had special training in design at Alfred University, has been added to the staff and has been placed in charge of a ceramic unit sponsored by the Georgia State College for Women at Milledgeville. The supervisor acts as an art consultant on all design work produced in other shops, and with her help an ever-improving program of art development for these young people who are to be the producers of tomorrow will be established.

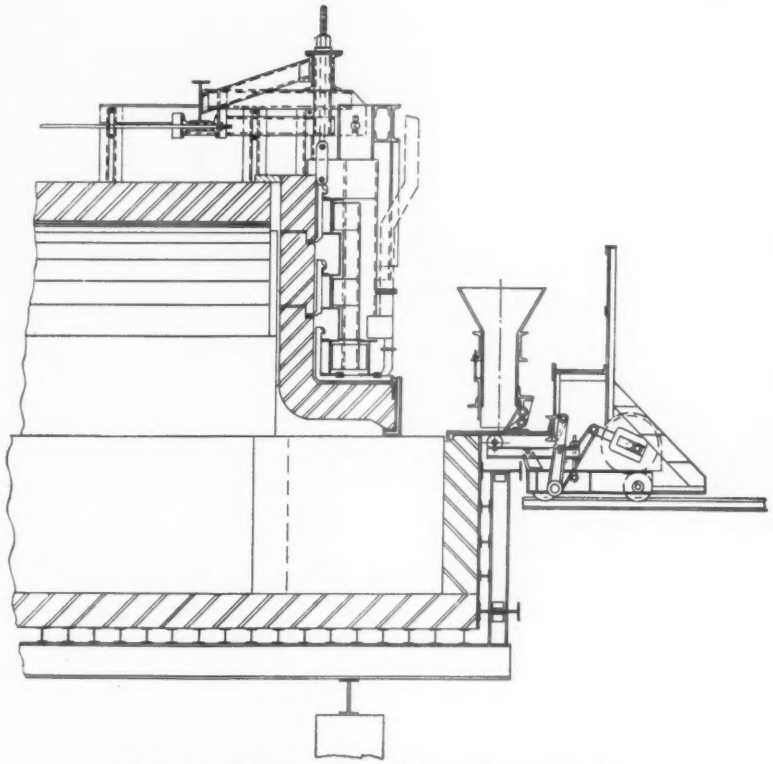
MILLEDGEVILLE, GEORGIA

ANOTHER PUBLICATION ISSUANCE SCHEDULE

The postal authorities will not permit the issuance schedule for the *Journal*, *Ceramic Abstracts*, and *The Bulletin* as inaugurated with the January 15, 1942, issue, and continued through April 15, 1942.

To meet the objections, (1) *The Journal*, beginning with the May issue, was mailed as usual on the 1st of the month; its present volume is Vol. 25. (2) *Ceramic Abstracts* and *The Bulletin* are being issued under one cover on the 15th of the month; the current volume number of each publication is Vol. 21.

These two changes made in the midyear publication should not confuse any binder if a careful check is kept on consecutive page numbers.



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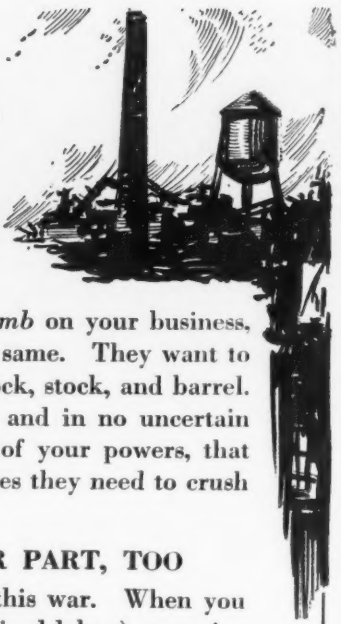

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Maybe they won't actually come and drop a *bomb* on your business, but the Axis war lords have their eye on it, just the same. They want to wipe it out as a competitive force—or take it over lock, stock, and barrel. Here is a threat that you can reply to *now*, today, and in no uncertain terms—by buying Defense Bonds to the very limit of your powers, that our armed forces may have the guns, tanks, and planes they need to crush the Axis *once and for all.*

HELP YOUR EMPLOYEES TO DO THEIR PART, TOO

Every American wants the chance to help win this war. When you install the Pay-Roll Savings Plan (approved by organized labor), you give your employees that chance. For details of the Plan, which provides for the systematic purchase of Defense Bonds by voluntary pay-roll allotments, write: Treasury Department, Section S, 709 12th St. NW., Washington, D. C.

***Make Every Pay Day* "BOND DAY"**
***Save with* U. S. *Defense* BONDS ★ STAMPS**

This space is a contribution to Victory by
The American Ceramic Society, Inc.

HOW DU PONT IS HELPING

the Ceramic Industry meet today's problems

PRESENT conditions have brought about decided limitations on the types of ceramic and glass colors available. Some makeshifts will be required, which may mean lessened brightness and clearness. In order to conserve materials, solid color decorations, body stains and broad color bands will probably be decreased considerably. Du Pont research is doing its best to find substitutes for scarce raw materials and colors.

Du Pont chemists have given the ceramic and glass industries many important new products. Precious metal decorations are as yet still available. Du Pont vitrifiable colors are more valuable than ever for permanent labeling on glass packages, because they save materials and labor that would otherwise be needed for repeated labeling.

★ ★ ★ ★

Let us work with you on your decoration problems. If there is a reasonable way to substitute for scarce or unavailable materials, du Pont Technical Service may be helpful to you.

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CERAMIC
PRODUCTS
DIVISION

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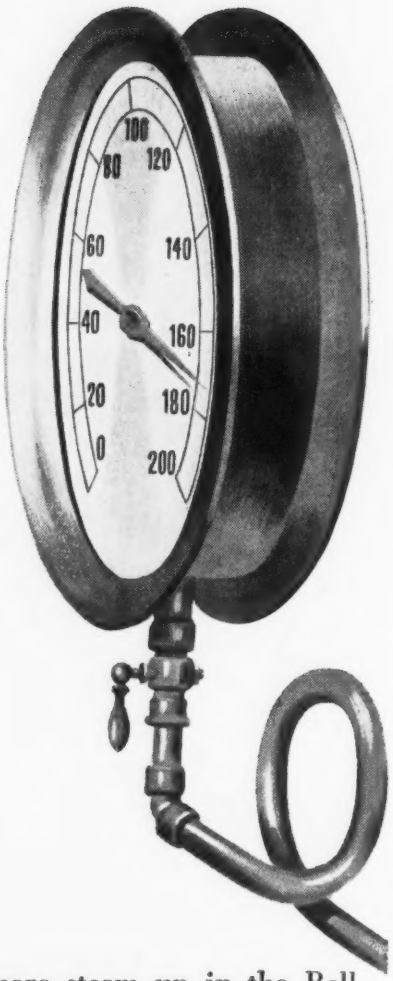

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H. C. SPINKS CLAY COMPANY

Miners and Shippers of

BALL, SAGGER AND WAD CLAY

NEWPORT, KY.

May 1, 1942

Mr. Pete Potter
Comfortable Sanitary Pottery Mfg. Co.
Pottsville, U. S. A.

Dear Pete:

The Annual Meeting of the American Ceramic Society at Cincinnati was a lot of fun. The papers and discussions on Ball Clays were, of course, the most interesting to us.

Ball Clays differ so greatly; they are indeed Rugged Individuals and must be treated as such. All have their usefulness if properly handled and used for the right purposes. For these reasons all clays should, in our opinion, be specifically named in all discussions and papers presented to the Society. To avoid wrong conclusions, and in order to make the greatest possible use of these efforts, let's be sure to tie the results to the particular materials and procedures that were used.

See you again soon, I hope.

Sincerely,

Dick Carothers

General Manager
H. C. SPINKS CLAY COMPANY

RBC.MLN

SCRUB- SCRUB- CHILD AND TUB -

IT'S amazing to see what one small child can do to the clean surface of a bath tub. And if there happen to be several youngsters in the family, efforts to keep the surface in its original gleaming condition constitute a real test of the enamel finish. ● At the M & T Ceramic Laboratory our technicians are constantly working with manufacturers of enamels and glazes to help them produce finishes that will stand up under hard daily usage. ● Careful laboratory control in the manufacture of Metal & Thermit Tin Oxide and Sodium Antimonate assures a high degree of opacity and a brilliant *lasting* finish, whether color or white.

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